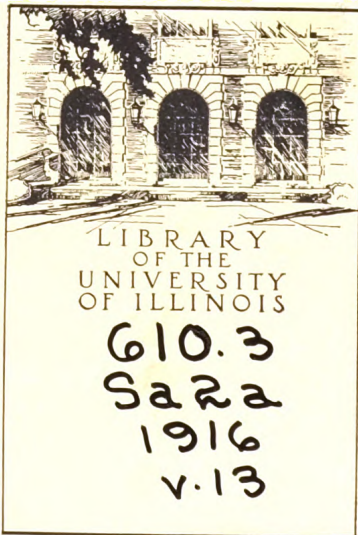


NEW THIN PAPER FORMAT















SAJOUS'S  
**ANALYTIC CYCLOPEDIA**  
OF  
**PRACTICAL MEDICINE**

BY  
CHARLES E. de M. SAJOUS, M.D., LL.D., Sc.D.

AND  
LOUIS T. de M. SAJOUS, B.S., M.D.

WITH THE ACTIVE CO-OPERATION OF OVER  
ONE HUNDRED ASSOCIATE EDITORS

SEVENTH  
ENTIRELY REVISED AND GREATLY ENLARGED  
EDITION

---

Illustrated with Full-page Half-tone and Color Plates  
and Appropriate Cuts in the Text

---

VOLUME THIRTEEN

**SUPPLEMENT**



PHILADELPHIA  
**F. A. DAVIS COMPANY, PUBLISHERS**

1929



COPYRIGHT, 1929  
BY  
F. A. DAVIS COMPANY.

---

Copyright, Great Britain. All Rights Reserved.

PRINTED IN U. S. A.  
PRESS OF  
F. A. DAVIS COMPANY  
PHILADELPHIA, PA.



610.3

S222

1916

v.13

## FOREWORD

---

THE plan carried out in the more recent SUPPLEMENTS, which had for its object to conform its subject matter, as regards arrangement, to that adopted for the CYCLOPEDIA proper, has been found so eminently practical by our readers that it has been continued in the present volume. It presented the great advantage also of making it possible to incorporate a far greater number of progressive facts than any similar work of its size, while affording the reader of the CYCLOPEDIA an unbroken continuity in the progress made in any subject treated in the latter work.

The far-reaching meaning of the data incorporated in the present volume as aids in practice may be readily gathered by glancing through its pages. Abdominal pain, for instance, is generally given due importance in text-books, but how recognize the specific diagnostic meaning of each of its many forms, thus greatly facilitating the early recognition of the disease present, and enhancing thereby success of any line of treatment adopted? A perusal of the section on the subject will answer this question. Acidosis, backache, anorexia, the arrhythmias, anaphylaxis and allergy, basal metabolism, the various phases of blood-pressure and the treatment indicated, may be cited as additional examples of the information of this sort which it is the SUPPLEMENT's purpose to convey.

Various disorders are leaving the domain of the specialist to enter that of the general practitioner. Cataract affords an example of this trend. While opacity of the lens remains the dominant pathologic factor involved, the nature of this factor is increasingly asserting itself as one susceptible to general treatment, prophylactic as well as curative. Appendicitis is likewise increasingly invading the field of the internist though in intimate association with that of the surgeon to which it formerly belonged almost in its entirety. McBurney's point no longer suffices to locate the diseased appendix, nor does even Lanz's, so irregularly placed is the diseased organ located in various individuals, as shown by Dr. Carnett's outline plate. Conversely, angina pectoris, so eminently a medical subject in former days, is now steadily increasing its claim to the attention of the surgeon.

Newer subjects, or questions which, though dominant, should have received greater general attention, are either introduced or brought to light

(iii)

anew. Among these may be mentioned agranulocytic angina, a form of disorder of the respiratory tract associated with blood changes; Ayerza's disease, which underlies the "black cardiac" appearance of its victims; azotemia, closely associated with diabetes and various hepatic diseases as regards the relations of the urea nitrogen to the total nitrogen; thromboangiitis obliterans or Buerger's disease; the endocrinopathies so rich in their explanation of mooted points in many disorders, both pathogenic and therapeutic; bacteriophagia, a newer factor in our interpretations of immunity and the many therapeutic measures that it appears to suggest, and various other disorders.

The progress of practical therapeutics, a subject which has gained for the CYCLOPEDIA an enviable reputation as a helpful guide in practice, is also worthy of special notice. The newer facts garnered under the title of arsphenamin, particularly the newer preparations, fittingly exemplify the wealth of data made available in an easily apprehended form for the practicing physician; the so-called "liver treatment" of the anemias and various other disorders may also be cited in this connection. Some diseases are analyzed at length in the general text whenever newer lines of treatment demand it or older lines of treatment have received additional support. On the whole, the general aim of the editors has been to assist the practitioner in every department, general or special, in all the phases of his daily work.

In the accompanying INDEX, bound separately, will be found listed all items contained in your 8-volume CYCLOPEDIA and succeeding SUPPLEMENTS.

It is the painful duty of the senior editor to record the death on January 16th, at the age of forty-two years, of his beloved son, Dr. Louis T. de M. Sajous, his colleague and working mate, to whose devotion and unusual acumen the best analyses in the various SUPPLEMENTS published so far, including that represented by the present volume, should be credited.

THE SENIOR EDITOR.



# SAJOUS'S ANALYTIC CYCLOPEDIA *of* PRACTICAL MEDICINE

## SUPPLEMENT

### A

#### ABDOMEN, SURGERY OF.—

The present trend of abdominal surgery may be said to involve an increasing attention to physiologic principles, in addition to the pathologic conditions encountered at operation. As aptly stated by Allen B. Kanavel (Jour. Amer. Med. Assoc., May 7, 1927), we have reached another era of surgical progress—that of physiology and chemistry. The anatomic and pathologic surgeon merely attempted to restore the anatomy to normal as he understood it. Thus, he might do a gastroenterostomy on a stomach out of what he conceived to be the normal position, not knowing that the new opening would not function physiologically with an unobstructed duodenum; he short-circuited the ileum to the sigmoid, forgetting that retroperistalsis of the colon would carry the intestinal contents into the blind pouch above rather than hasten its exit. He did not realize that the varying pictures of indigestion due to cancer or ulcer of the stomach or to chronic appendicitis should be assigned to the incipient lesion and treated long before they gave rise to gross changes demanding emergency surgery. The

aim of the present-day physiologic surgeon is to anticipate and prevent pathologic changes, and pursue surgical procedures having for their end the restoration of normal physiologic function rather than normal anatomic conditions. This, however, requires long training in the basic sciences; surgery is less of an art today and more of a science.

In spite of the greater attention paid to correct underlying principles in surgical treatment, there has been some alarm of late regarding an increase of mortality from certain abdominal conditions. Thus, J. O. Bower (Amer. Jour. Med. Sci., Aug., 1927) emphasizes an increasing mortality from acute appendicitis, shown both by foreign and American statistics. In Philadelphia there was an increase of 18 per cent. between the years 1915 and 1923, and the increase in the death rate from appendicitis during the past 10 years has been 9 per cent. greater than that from cancer. The mortality from appendicitis in some years exceeds 8 per cent. Various reasons for this condition of affairs have been suggested. According to Bower, reviewing 1010 cases of the "acute surgical abdomen,"

the chief reason for high mortality is loss of time between the onset of symptoms and operation. Along with acute appendicitis, intestinal obstruction is particularly deserving of consideration in this connection. Among 751 cases of acute appendicitis, the average time between onset of symptoms and operation was 69.1 hours in the cases that recovered and 151.0 hours in those that died. Among 129 cases of intestinal obstruction the corresponding intervals were 23.5 hours and 56.1 hours. Gangrene may occur as early as 5 hours and perforation as early as 12 hours after onset. Bower agrees with Cope that the majority of severe abdominal pains in patients previously well and which last as long as 6 hours are caused by conditions needing surgical intervention. The mortality in the acute abdominal conditions is diminished by refusal of the family physician to assume the responsibility for the patient's life in the presence of persistent acute abdominal pain, and his sharing it with a surgeon.

G. W. Crile (Practitioner, Jan., 1927), discussing *anociation* (previously "anoci-association"), stresses the need of an optimum temperature of the body, especially of the liver. In abdominal operations, **diathermy** or **hot packs** are applied to insure maintenance of liver function. Regarding certain special conditions, Crile makes the following recommendations:

*Cancer and Ulcer of Stomach.*—(1) Pre-operatively, large quantities of **sodium bicarbonate** and **glucose** (5 per cent. of each, by rectum) and subcutaneous injection of 2000 to 4000 c.c. of **normal saline solution**. (2) In anemia, **blood transfusion**.

(3) If the patient is *in extremis*, a temporizing operation in his room may be performed. (4) **Nitrous oxide analgesia**, principal dependence being placed upon **local anesthesia**. (5) An ample incision, to avoid traction on the stomach. (6) In bad risk cases, only gastroenterostomy at the first séance. (7) Resection after a sufficient interval for establishment of nutritional balance. (8) Sharp knife dissection. (9) Wide excision in carcinoma. (10) Partial gastrectomy for ulcer. (11) Round needles for suturing the stomach. (12) Avoidance of post-operative hemorrhage by the cobbler's stitch. (13) Light tying of the interrupted sutures. (14) Prompt use of **stomach tube** in post-operative vomiting. (15) Special attention throughout to keeping the patient **warm** and to the maintenance of nutritional and water balance. (16) Post-operative control for many months.

*Gall-bladder Disease.*—*A. Acute Empyema or Perforation of Gall-bladder.*—(1) **Nitrous oxide-oxygen** only. (2) Division of abdominal wall over center of the most tender and most rigid area. (3) At primary operation, only **drainage**; removal of gall-bladder deferred until infection has subsided and jaundice disappeared. (4) Cholecystectomy when the condition of patient permits. (5) Post-operative drainage through Morrison's pouch.

*B. Jaundice.*—(1) Delay of operation until danger of hemorrhage is obviated by following measures: (a) **Calcium lactate**, 10 grains (0.6 Gm.) by mouth every 4 hours. (b) If clotting time is 5 minutes or more, 10 c.c. (2½ drams) of 5 per cent. **calcium chloride** solution intravenously for 3

successive days, the calcium lactate being continued as above. (c) 1000 to 1500 c.c. of 10 per cent. **glucose** with **orangeade**. (d) High caloric, low protein **diet** every 2 hours during day. (e) Two **transfusions**, one before and one after operation, as indicated. (f) Where complete absence of bile in stools, desiccated **ox-bile**, 60 to 90 grains (4 to 6 Gm.) daily. (g) **Diathermy over liver** after operation. (2) Operative procedures as under *A* above.

*Peritonitis*.—(1) Operation in patient's room is indicated. (2) Preliminary operation for drainage. (3) Alonzo Clark **opium** treatment. (4) **Hot packs** over entire abdomen and sides. (5) Subcutaneous injections of **normal saline solution**, 2000 to 4000 c.c. daily. (6) Removal of cause after acute danger has passed.

W. Thalhimer (Anesth. and Analg., Jan.-Feb., 1928) states that any patient with a moderate *anemia*, whose hemoglobin is in the neighborhood of 70 per cent., should receive 1 or more **transfusions** of at least 500 c.c. of **blood** before he is submitted to a major operation. Transfusions are very valuable in cases developing a severe anemia after operation and running a temperature.

The favorable results of 4 years' effort to minimize the mortality rate of surgical procedures in *diabetes* by means of insulin and other measures have been recorded by E. S. Judd, R. M. Wilder and S. F. Adams (Jour. Amer. Med. Assoc., Apr. 10, 1926). At the Mayo Clinic, during the last 3 of the 4 years in question, no patient was refused necessary surgical procedures because of diabetes. Among 304 cases of major operations the number of deaths was 18, and

among 363 cases of minor operations, 2. None of the deaths were directly attributable to diabetes. While surgical diabetics are very susceptible to acidosis, the risk of acidosis can be practically eliminated by proper treatment. The patient receives a **diet** containing 140 Gm. of carbohydrate for 4 days before operation, unless a surgical emergency necessitates less delay. **Insulin** is used in the amounts required to control any glycosuria that may arise. After operation, he receives insulin and **glucose**, the latter being started by proctoclysis and later, after nausea has disappeared, continued in the form of fruit juices and ginger ale by the mouth. Enough insulin is given in repeated doses so that at least 75 Gm. of glucose is metabolized every 24 hours. All urine is tested for sugar and diacetic acid. The plasma carbon dioxide capacity is estimated whenever there is clinical evidence of acidosis, and the slightest acidosis is combated.

As regards the *cardiovascular risk* in surgery, A. E. Phelps (Anesth. and Analg., Aug., 1927) recommends a preliminary inquiry for such features as dyspnea or pain in response to effort either on the level, on a grade, on stairs, against the wind, or when hurrying; the location, radiation and duration of the pain; constriction of the chest; exhaustion; thickened or tortuous vessels; the size of the heart, as well as the intensity of its sounds; murmurs, thrill, and rhythm, etc. The subjective symptoms of heart failure are never absent when the heart's efficiency is in any way impaired. In men, cardiovascular subjective symptoms and objective signs indicate impairment much more serious than do the same



evidences in women. **Supporting measures** and **minimizing the duration of the operation** are important features in reducing mortality in cases with cardiovascular impairment. During the latter part of a long operation, a combination narcotic such as **morphine**,  $\frac{1}{6}$  to  $\frac{1}{4}$  grain (0.01 to 0.016 Gm.), **scopolamine**,  $\frac{1}{50}$  to  $\frac{1}{100}$  grain (0.0012 to 0.0006 Gm.), and **atropine**,  $\frac{1}{150}$  grain (0.0004 Gm.), hypodermically should be substituted for inhalation anesthesia. In an abdominal operation lasting 2 to  $2\frac{1}{2}$  hours, the last 1 or  $1\frac{1}{2}$  hours require no inhalation anesthetic when these drugs are employed. **Absolute rest after operation** is vital in a poor risk case.

Movements of the arms and legs, at times sufficient to require moderate restraint, nearly always accompany the return of consciousness. This exertion may be prevented by injecting the above narcotics 10 to 15 minutes before the end of the operation. The patient then remains in a deep sleep for 4 to 6 hours.

**ANTEOPERATIVE MANAGEMENT.**—Pre-operative measures may vary somewhat to meet the needs of certain special organs, such as the liver or kidney, or to alleviate troubles due to obstruction in the alimentary tract. For the majority of abdominal operations, however, the following scheme of preparation is advocated by W. E. M. Mitchell (Lancet, Aug. 6, 1927):

(1) **Removal of any sources of focal infection**—*e.g.*, septic teeth, tonsils. (2) Ensuring a free daily evacuation of the bowels by **liquid petrolatum** night and morning. (3) A course of **tonic treatment** with fresh air, exercise as far as possible, and

suitable food. (4) Admission to the nursing home or hospital not later than 6 P.M. on the day before operation. (5) The patient then has a **warm bath** and goes to bed. (6) The anesthetist and surgeon visit the patient in his room, and see that the nurse understands the technique of preparation. (7) A light supper, such as soup, boiled fish or chicken, with plain sauce, spinach, butter, toast and plain biscuit, jelly; no potatoes, fresh bread, cheese, strong tea or coffee; unrestricted fluids to drink. (8) Skin of whole anterior abdominal wall and groins to be shaved, washed with ether, and covered with a sterile towel. (9) Later in the evening, when patient is feeling sleepy, he is given a hot drink of ovaltine or malted milk. (10) A mild laxative such as that to which the patient is most accustomed—*e.g.*, **liquid petrolatum**, **senna**, **licorice**—is administered in the dose which he knows to be effective under normal circumstances. (11) **Teeth scrubbed** thoroughly with a new tooth-brush and an antiseptic tooth-paste. (12) Lights out at 10.30 P.M. or at discretion of nurse. (13) Night nurse ensures a good night's rest, gives hot drinks, etc., but after 2 A.M. only water or sweetened lemonade. (14) Sleep on no account to be disturbed till 7 o'clock. (15) A glass of **hot water** to drink on waking. (16) **Teeth scrubbed** as before; toilet completed (including shaving). (17) **Enema** only if no result from laxative by 7.30 A.M. (18) 8.30 A.M., hypodermic injection of **atropine**,  $\frac{1}{100}$  grain (0.00065 Gm.), and **morphine**,  $\frac{1}{6}$  grain (0.011 Gm.). (19) **Bladder emptied**. If not, note is sent with patient to the operating theatre with

time of last micturition indicated.  
(20) Operation at 9 A.M.

An abdominal catastrophe, such as *perforation* of a viscus or *acute pancreatitis*, gives rise to immediate shock and prostration so great that the patient is a bad operative risk during the first hour or so. Such a case is best treated by a full dose of **morphine** after the diagnosis has been made, and by being kept **warm** in bed between **blankets** with **hot-water bottles**, until the initial severe shock passes off. In *acute appendicitis*, especially in children, the hour or two that may have to elapse before operation is most usefully spent in giving **glucose** per rectum. Acidosis is already present in a large proportion of them.

The washing out of the stomach in cases of acute *intestinal obstruction* has not established its place in pre-operative preparation. In such cases, **spinal** or **regional anesthesia** seems to hold out better hope of success than does general anesthesia with its attendant risks of vomiting and aspiration of foul fluid into the lungs.

H. H. Cox (Ill. Med. Jour., July, 1927) points out that many patients, especially foreigners, are accustomed to sleeping in heavy underwear, and with one or more feather beds for cover. Yet surgeons not uncommonly operate on a patient covered only by a gown, stockings and laparotomy sheets, with a window open and an electric fan playing upon the patient. Having all patients wear **flannel jackets** and keeping the part of the body not involved in the operative field covered by blankets do much to prevent shock. Immediately after the operation, the flannel jacket should be changed, a dry gown put on, and the patient carefully wrapped in blankets. Care should be taken that the halls are not drafty and that windows are not open.

Sir Berkeley Moynihan (Lancet, Oct. 16, 1926) recommends **blood transfusion** when severe hemorrhage has recently occurred, as in ulcer of the stomach or duodenum, in splenic anemia, in fibroid tumors of the uterus, or when carcinoma is present; in cases of anemia associated with growths in the stomach or colon, and in general enfeeblement when the red cells are below 4,000,000. As a rule, only 1 transfusion is necessary, but he has on a few occasions given as many as 5. Transfusion may be employed both before and after operation. On many occasions, after gastrectomy, especially for carcinoma or jejunal ulcer, transfusion of 15 ounces of blood a few days after the operation seems to alter the whole prospect of the case.

In *jaundiced* patients, or in patients with *hepatic insufficiency*, a direct transfusion of blood, the intravenous use of **glucose**, with or without a little **sodium carbonate**, on 2 or 3 occasions, or continuously; a very generous carbohydrate **diet**, and an abundance of **fluid** by the mouth, all help to lessen the dangers of operation. Chloroform should never be given, and as little ether used as possible. **Local anesthesia**, with **gas** and **oxygen**, will often suffice; the surgeon should not ask for complete relaxation of the abdominal muscles.

*Skin Sterilization.*—In investigations on the efficiency of skin antiseptics, our Associate Editor, M. B. Tinker, with H. B. Sutton (Ann. of Surg., Oct., 1925), found that careful ward preparation, with ether swab on the table, is capable of giving skin free from bacteria in 75 per cent. of cases, and of reducing the colonies in the remainder to a low figure. Selective

action is so important that it seems best not to depend on any single antiseptic for skin preparation. Iodine preparations, picric acid, or alcohol alone are too inefficient under ordinary clinical conditions to be depended upon. **Acriflavine**, 5 per cent., proved most efficient in the writers' series of tests. In a later communication, these observers (Jour. Amer. Med. Assoc., May 14, 1927) again recommend the acriflavine solution, preferably and conveniently prepared as follows: The acriflavine is put up in 0.5 Gm. powders, and a stock solution made consisting of 100 c.c. of acetone and 375 c.c. of water added to 525 c.c. of 95 per cent. alcohol. The acriflavine solution is best made freshly in the operating room and cannot be relied on if more than a week old or if any precipitate has formed. It is best kept in a dark-colored bottle away from the light. For use, enough powdered acriflavine is added to some of the stock solvent to make a 5 per cent. solution. For painting 2 coats on a small operative field 10 c.c. suffice, and for average operations 20 c.c. are ample. The previous ward preparation, usually  $2\frac{1}{2}$  to 4 hours before the operation, comprises: (1) Shaving or a depilatory; (2) scrubbing with soap and moderately hot water for at least 5 minutes, the lather being sponged away with sterile water; (3) removal of any fat left by the soap with ether or other fat solvent; (4) sponging with alcohol for 2 or 3 minutes. On the operating table, the sterile dry dressing is removed, the area again scrubbed with ether with gauze sponges for 3 to 4 minutes, and the acriflavine solution then painted on with a cotton swab, allowed to dry,

and a second coat similarly applied. All the acriflavine should be left on the skin. It is non-irritating and non-poisonous.

Bacteriologic tests on disinfection of the hands by A. F. Martin (Northw. Med., July, 1927) showed the following order of efficacy among the substances used: Harrington's solution, 70 per cent. alcohol, 5 per cent. thymol in 60 per cent. alcohol, mercury cyanide solution (7 grains in 500 c.c. of water), and eupad (chlorinated lime and boric acid, 1 dram each in 1000 c.c. of water). Scrubbing, while ineffectual alone, is a valuable preliminary to disinfection of the hands, as shown by comparison of results with the various solutions with and without scrubbing.

*Sterilization of Instruments.*—Sterilization of cutting instruments in liquid petrolatum is endorsed by F. H. Lahey and R. L. Mason (Surg., Gyn. and Obst., Aug., 1925), who describe a sterilizer of aluminum especially designed for the purpose. The wall of the sterilizer includes  $1\frac{1}{2}$  inches of asbestos, and the closure of the cover prevents escape of fumes, a great saving of heat being thus effected. The best temperature for sterilization is 150 to 160° C. The oil is brought to this point in not over 30 minutes, and is kept within 1 degree of any desired temperature by a thermostat. Knives, scissors and needles are sterilized for 10 minutes. Cutting edges are not affected.

*Anesthesia.*—An analysis of questionnaires sent to surgeons by E. M. Stanton (Ann. of Surg., Aug., 1927) showed that about 85 per cent. of surgeons now use *ether* in operations of the type of the average laparotomy. Out of 657 surgeons, 555 used



ether alone or relied largely on it after starting with some other volatile anesthetic. About 60 per cent. of the ether-using surgeons employed straight ether. Of the remainder, the great majority used the nitrous-oxide ether sequence, a few ethylene + ether, and 3 surgeons ethyl chloride + ether.

In spite of the existing general tendency toward ether, increasing attention is being paid to combined methods and local anesthesia in abdominal surgery, in order to avoid or minimize possible harmful effects of ether on parenchymatous organs. Thus, H. Finsterer (Anesth. and Analg., Dec., 1926) urges that through diseases of abdominal organs, such as acute appendicitis or cholelithiasis, serious changes are caused in the liver, and that an exclusive chloroform or ether anesthesia may cause fatal hepatic insufficiency. He does not now operate on patients who insist upon a general anesthesia, being convinced of the advantages of combined and regional anesthesia over the former method. He advocates *combined anesthesia* in laparotomy whenever regional anesthesia is inadequate. Through careful anesthesia of the peritoneum of the anterior abdominal wall the greater part of the narcotizing agent can be avoided. Nitrous oxide and narylene (acetylene) are the least injurious of the narcotizing agents. *Mesenteric anesthesia*, *i.e.*, injection of procaine into the mesentery, is valuable and almost harmless, and may be resorted to in every case of combined anesthesia. Mesenteric anesthesia alone is satisfactory in cases in which all pulling can be avoided. It is entirely satisfactory in resection for a movable ulcer or cancer in ptotic stomach.

In general narcosis it decreases the operative shock. *Paravertebral anesthesia* should be used only in operations in which the injection on one side suffices. *Splanchnic anesthesia* by Braun's method, *i.e.*, blocking of the united nerve-trunks of the splanchnic after opening the peritoneal cavity, is almost without danger, and in about 90 per cent. of operations on the upper abdomen is sufficient. By regional anesthesia, death from so-called operative shock, pneumonia, and atony of the bowel can be almost always avoided. The writer has not had a single fatality from pneumonia in 841 stomach resections for ulcer, 185 intestinal resections, and 259 cholecystectomies.

*Combined paravertebral and spinal anesthesia* gives very good results, according to E. Beck (Zent. f. Chir., Feb. 5, 1927). For operations on the gall-bladder, the lumbar injection is preceded by paravertebral anesthesia of the 9th to the 11th thoracic nerves on the right side; for operations on the stomach, by anesthesia of the 7th and 8th thoracic nerves on both sides. From 7 to 10 c.c. of a 1 per cent. solution of procaine hydrochloride with adrenalin are used for each segment.

G. P. Müller (Amer. Jour. Med. Sci., May, 1927) now uses ether much less frequently than 10 years ago—mostly when nitrous oxide or ethylene is insufficient to afford relaxation. He does practically every abdominal operation under *gas anesthesia* plus extensive infiltration with 0.5 per cent. *novocaine* solution. The inhalation anesthesia can be stopped as soon as the peritoneum is closed, and the patient is talking rationally before leaving the operating room. Chronic appendicitis and hernia are often dealt with under local anesthesia alone, and colostomy or enter-

ostomy for intestinal obstruction, always. In large clinics the use of straight ether is constantly diminishing. The sick patients who furnish the mortality—the prostatic, the depressed cardiorenal patient, the diabetic, the jaundiced, the patient with intestinal obstruction or acute appendicitis—do not stand ether. Miller has shown experimentally that after ether or chloroform the stomach remains relaxed, while the small intestine early shows exaggerated peristalsis and the colon soon develops a high tonicity which may approach spasticity, producing a partial colon obstruction and “gas pains” through the exaggerated peristalsis of the small intestine above. Ethylene and oxygen, on the other hand, produce little effect on the movements of the gastrointestinal tract. In the last year 33 per cent. of operations in Müller’s clinic were done under *nitrous oxide-oxygen* and 15 per cent. under *ethylene-oxygen*. The ethylene is used where nitrous-oxide fails to afford relaxation. Owing to the combination of *local anesthesia* with gas as a routine in abdominal operations, further addition of ether for relaxing purposes is rarely necessary. Only 1 death could be traceable directly to gas anesthesia. Cases with high blood-pressure and poor cardiac risks are ordinarily excluded from gas anesthesia, and given local anesthesia or, if necessary, ether if the kidneys can be protected. Among the “sick patients” mentioned above, the mortality is cut enormously by using local anesthesia to the limit and giving “floods” of water postoperatively.

In upper abdominal operations J. T. Mason (Ann. of Surg., Apr., 1926), comparing *local* and general *anesthesia*, found

that an average of 8 minutes more was required for operations under local than under ether. The average temperature for the first week was below 99° F. in local cases and above it in ether cases. The average stay in the hospital was 3 days less after local. Of 50 local cases, 18 vomited; of 50 ether cases, 33. Gas pains occurred in 19 local as against 30 ether cases. The 5 cases of shock were all after ether. Bronchitis followed local anesthesia in 3 and ether in 11. According to the nurses, the general condition following local was much nearer normal than after ether, morale was higher, convalescence greatly shortened, and the family and friends relieved of much anxiety.

[See also the separate heading, ANESTHESIA].

*Incision.*—There is still considerable variation of opinion and preference among surgeons as to abdominal incisions. In an attempt to settle experimentally the relative value of different incisions, R. B. P. Monson (Med. Jour. of Austral., Dec. 11, 1926) performed experiments in the wallaby, an Australian animal usually maintaining the upright posture and with practically the same stress on its abdominal muscles as exists in man. Two months after laparotomy incisions the animals were killed and histologic studies made to ascertain the amount of resulting muscle degeneration.

The incision producing the least damage was that in which, after the *rectus* sheath had been opened, the muscle was *retracted medially*. By this approach the abdomen may be opened rapidly, with little bleeding, and a good exposure obtained. This is contrary to the general teaching that too many nerves are injured and much muscle degeneration may be caused. This teaching overlooks the very free anastomosis of nerve



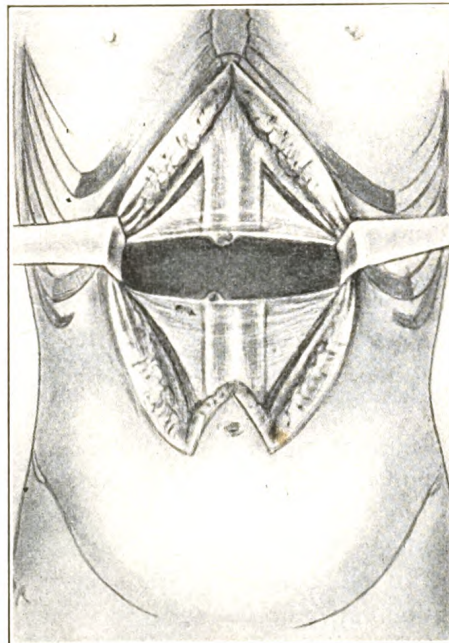
fibers in the muscle layer between the lower intercostal nerves.

The next best incision is the *mid-rectal* incision with splitting of the fibers of the rectus. A little more degeneration is present here than in the previous incision. The results do not bear out the hypothesis that this incision causes degeneration in the area below the incision and a liability to incisional and inguinal hernias.

With the *gridiron* incision there was a very considerable amount of degeneration in all areas examined. The pathologic changes in the medial and lateral aspects of the incision suggest the likelihood of a subsequent ventral hernia. In the approach through the rectal sheath with *lateral retraction* of the *rectus*, the changes in the medial half were uniformly great in the 3 areas sectioned, while sections below the incision revealed marked changes.

An incision providing exposure to the upper abdomen without greatly weakening the abdominal wall has been described by G. A. Sloan (Surg., Gyn. and Obst., Nov., 1927) and used in 114 cases. It preserves the recti and the fibers of their posterior sheaths, and does not interfere with the nerve or blood supply. It permits approach to the appendix and exploration of the entire abdomen. An incision to the aponeurosis is first made from the ensiform to a point  $3\frac{1}{2}$  centimeters ( $1\frac{1}{8}$  inches) above the umbilicus. It is then continued outward and downward on either side about 4 centimeters ( $1\frac{1}{8}$  inches) below the umbilicus, leaving a V-shaped piece of skin and subcutaneous tissue around the umbilicus. A flap of skin and fat dissected outward exposes the aponeurosis over the inner borders of both rectus muscles. Then vertical incisions are made through the external sheath of the recti about 1 centimeter ( $\frac{1}{2}$  inch) lateral to their inner borders. Upon the length of

these 2 incisions depends the amount of exposure obtained. The recti, with the overlying external sheath, fat and skin, are rolled outward and held by suitable retractors. A transverse incision is made through the exposed posterior sheath of the rectus and the peritoneum and extended across the linea alba parallel to the direction of the fibers from the *outer* edge of one rectus muscle to the *outer* edge of the other. Lateral and vertical retraction



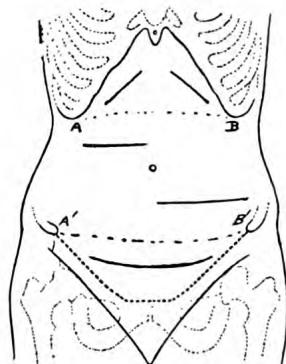
The Sloan incision. Vertical incisions through the external sheaths of the recti have been made, and followed by outward retraction of these muscles and a transverse incision through the posterior sheaths and peritoneum. Extensive retraction in any desired direction is then readily made. (Surg., Gyn. and Obst.).

affords an opening with a diameter about equal to the length of the incisions in the anterior sheaths of the recti.

With this incision there is almost complete absence of tension on the sutures of the posterior fascia layers, minimizing adhesions to the scar. The danger of wound separation and hernia is almost entirely eliminated. Four-fifths of the post-operative discomforts following longitudinal in-

cisions are prevented. Gas anesthesia suffices. Convalescence is shortened.

H. Peet (Med. Jour. of Austral., Dec. 11, 1926) prefers the *transverse incisions* whenever ample exposure and freedom from postoperative hernia are predominant needs. In all other



Diagrammatic representation of transverse incisions. Above the dotted line A B, the incisions are oblique. Below A' B', they are curvilinear. Between A B and A' B', they are transverse. (Peet, in *Med. Jour. of Australia*.)

abdominal operations, he uses the much easier and simpler vertical incisions, which, however, exhibit a tendency to postoperative hernia, owing to the constant lateral pull of the abdominal muscles and the injury to nerves. The transverse incisions are more favorable to sound healing, give excellent exposure, and avoid hernia, as the lateral pull of the muscles tends to close the incision. But they take longer to perform and to close than the vertical incisions. In a transverse incision the aponeurosis is divided in the direction of its fibers and the anterior sheath of the rectus divided to its full extent, the rectus muscle being either retracted or divided; if the latter, in sewing up the incision all tension on the rectus is removed by raising the head and foot of the operating table slightly.

In suturing, Peet finds it very advantageous to use silkworm-gut compression sutures and what he terms the "envelope stitch" for the skin. The compression sutures [see diagram] are passed with a large curved needle through the whole thickness of the fat, starting about 2 centimeters ( $\frac{3}{4}$  inch) from the edge of the wound, passing through the ridge of sewn aponeurosis, and then emerging similarly, the whole forming a semicircle. In the envelope skin stitches, the distance between the 2 points of entry equals that between the entrance and exit. These stitches are easily and rapidly placed and produce accurate coaptation without tension. After they are completed, a thick roll of gauze is placed along the wound and the compression sutures tied separately and firmly over the gauze.

For gall-bladder surgery, Peet commends the *modified Kocher in-*

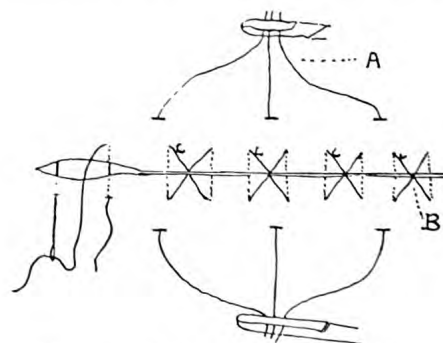


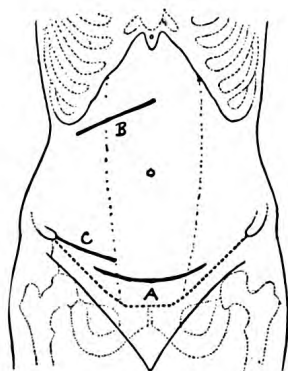
Diagram showing arrangement of envelope stitches (catgut) and tension sutures (silkworm gut). A, tension sutures temporarily held in forceps. B, incision with envelope stitches. (Peet, in *Med. Jour. of Australia*.)

cision, not parallel to the costal margin, but more inclined to the transverse, and beginning about 4 centimeters ( $1\frac{1}{2}$  inches) below the costal margin. For a quiescent ap-



pendix, he uses a muscle-splitting incision starting from the right anterior superior spine and curving downwards and inwards to the outer border of the right rectus. In females, however, he usually prefers a right *paramedial* incision, through which the pelvic organs can be examined and dealt with. In acute or subacute appendicitis, the only incision giving absolute safety is the *ilio-inguinal* incision described by Whitelocke in 1920. This affords access to the inflamed appendix from the outer or posterior aspect of the cecum, avoiding entrance into the peritoneal cavity. Its center is opposite and  $1\frac{1}{4}$  to 2 centimeters ( $\frac{1}{2}$  to 1 inch) internal to the anterior superior spine. With this incision, no patient with appendicitis or its complications, however severe, need die of toxemia.

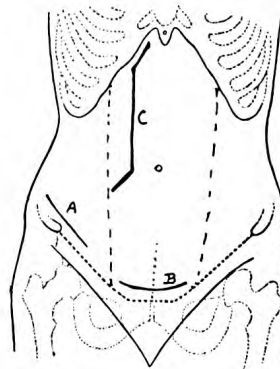
*Sutures.*—Use of a living autoplasmic



A, long curvilinear transverse incision for extensive pelvic operations. B, modified Kocher incision for operations on the gall-bladder and ducts. C, ideal incision for quiescent appendix. (Peet, in *Med. Jour. of Australia*.)

tendon suture in the gridiron incision for appendicitis is urged by A. M. Miller (*Surg., Gyn. and Obst.*, Jan., 1927). The aponeurosis of the external oblique is closed by a single

strand of attached living tendon  $\frac{1}{4}$  inch wide. This strand has been split from the upper free edge of the aponeurosis from below upward to the muscle belly, without severing its attachment at the upper end where the muscle fibers furnish a



A, incision for acute appendicitis (Whitelocke). B, transverse curvilinear incision for suprapubic prostatectomy or removal of stones, etc., from bladder. Dotted line shows the direction of incision through right rectus sheath. C = Bevan incision. (Peet, in *Med. Jour. of Australia*.)

better blood-supply. A mosquito forceps is thrust through the lower flap of the aponeurosis  $\frac{1}{4}$  to  $\frac{3}{8}$  inch from the margin, and the free end of the tendon caught and drawn through. This procedure is repeated, forming a running or laced suture, until closure is complete. The free end of the tendon is then secured with a single suture of catgut.

In cases with drainage, Reder (*Ann. of Surg.*, Mar., 1927) uses a twin mattress suture of silkworm gut. Materials of different color are employed in order to simplify the identification of the fascial structures carrying the different sutures. In cases in which the liability to post-operative hernia was great, this procedure gave excellent results.

In suturing fat abdominal walls, A. Edmunds (*Lancet*, Sept. 10, 1927) em-

ploys an "eversion stitch," inserted well away from the wound, picking up the whole thickness of the fat—or even the deeper tissues if tension stitches are required—and emerging at a corresponding point on the other side. It is then passed back over the surface, picking up the extreme edges of the skin incision on the way, and loosely tied. To prevent the surface portions of the suture from cutting into the skin, corrugated rubber sheeting is used on either side. Long artery forceps having been passed under the loops of the sutures on one side, the rubber sheeting is compressed laterally, grasped by the forceps, and drawn under the row of loops. The same procedure is then carried out on the other side. The stitches are inserted about 1 inch apart; if drainage is required there is plenty of room between them.

According to B. H. Goff (Surg., Gyn. and Obst., Dec., 1925), with the methods now available, the incidence of faulty union from all causes should not exceed 5 per cent. in clean and 70 per cent. (including drainage as a cause of faulty union) in contaminated incisions.

*Drainage.*—Opinions are still somewhat at variance in regard to the indications for drainage. As stated by A. Primrose (Ann. of Surg., July, 1927), however, it is essential to drain a septic focus in the peritoneum when one knows that suppuration will continue and that general peritonitis is likely to occur if the abdomen is closed without drainage. On the other hand, it may be possible to remove the septic focus and leave undamaged peritoneal surfaces behind. While it may be absolutely necessary to drain in many instances, it is equally essential to desist from drainage in others. The very presence of the drainage tube, damaging

the delicate peritoneum, may result in a spread of the infection. Frequently, in the removal of an acutely infected appendix without drainage, recovery without peritonitis occurs but the superficial fat and fascia become the seat of infection and suppuration. A drainage tube would, in such cases, be a distinct menace.

According to W. D. Kendig (Va. Med. Mthly., Jan., 1926), drainage of the abdomen principally accomplishes 3 objects: (1) Establishment of a sinus down to some one small area; (2) production of walling-off adhesions, and (3) relief of abdominal pressure. When used, it should have for its object one or more of these purposes. The recent tendency toward restriction of drainage is likewise illustrated in the assertion of X. Delore, H. Comte and Jouve (Rev. de chir., lxx, 441, 1927) that peritoneal drainage should be employed as little as possible except in cases in which the peritoneum is subjected to continued reinfection. The peritoneum is eminently capable of fighting infection, and these observers often drain, instead, the less resistant parietal tissues.

**POST-OPERATIVE COMPLICATIONS.**—*Shock.*—F. H. McMechan (Can. Med. Assoc. Jour., Dec., 1925) commends the system of grading circulatory depression laid down by the Anesthesia Research Society, which advocates blood-pressure determinations every 5 minutes during operations. The grades formulated are:

(1) *Safe.*—Fifteen per cent. increase in pulse-rate without increase in blood-pressure; or 10 per cent. decrease in blood-pressure without a decrease in pulse-rate.

(2) *Dangerous*.—Twenty-five per cent. increase in pulse-rate plus 10 to 25 per cent. decrease in blood-pressures.

(3) *Shock*.—A pulse-rate of 100 and rising, with progressively falling blood-pressures reaching a systolic of 80 mm. and a pulse-pressure of 20 mm. or less.

If shock continues for 30 minutes or more during operation, without effective remedial measures, death is almost inevitable in 24 to 72 hours.

This guide discloses the onset of shock at least 20 minutes before it is indicated in any other way, thus providing a period for safety-first measures. Among 1000 cases reviewed by Miller that were in shock for 30 minutes or more, the mortality was 69.23 per cent.

According to C. M. Anderson (Cal. and West. Med., July, 1927), surgical shock is a manifestation of suboxidation, due principally to insufficient elaboration of insulin in the tissues, with resulting intracellular acidosis. He used **glucose** and **insulin** pre-operatively in 30 cases for the prevention of shock, with asserted excellent results and a marked betterment in the general post-operative condition. His usual procedure is to give 60 grams (2 ounces) of glucose in a glass of lemonade followed with 20 units of insulin hypodermically the day before operation. Intravenous administration of glucose is reserved for certain cases in which the oral route is contraindicated.

H. J. Paterson (Practitioner, Oct., 1926) notes that in operations under gas-oxygen, or ether with morphine hypodermically and local injection of procaine, shock, if it occurs, is delayed until the effects of the anesthetics are passing off, at which time it is much easier to treat than during or just after the operation. In the treatment of shock, strychnine, brandy,

etc., are useless and even harmful. The best measure is **continuous saline proctoclysis**. **Pituitary solution** is of some value; 17 minims (1 c.c.) injected into the deltoid muscle causes a marked rise in the blood-pressure, lasting 8 or 10 hours. It is, however, a powerful drug, and the dose must be regulated according to the age and strength of the patient. The repeated **application to the head and forehead of cloths wrung out in very hot water** is a valuable adjunct. Where shock is due to the loss of blood, direct **blood transfusion** from a suitable donor should be carried out. The writer never gives intravenous saline injections, believing that in some cases they are harmful. If there be any difficulty with the rectal saline he prefers **hypodermoclysis** at the breast and axilla. The success of proctoclysis depends mainly on the skill of the nurse. A good nurse will get the patient to retain 8 to 10 pints of saline in 24 hours.

Both acute surgical shock and *hemorrhage* are almost completely controlled, according to G. W. Crile and C. C. Higgins (Jour. Amer. Med. Assoc., Nov. 19, 1927), by **blood transfusion** and **diathermy**. The blood of all patients is grouped routinely by these observers in order that a suitable donor may be available during any major operation. Indirect matching (Moss) usually suffices; 500 c.c. of blood is the usual amount, injected slowly. In patients with blood dyscrasia, Banti's disease and jaundice, direct matching should always be done. In prolonged operations, especially in the debilitated, transfusion just after or even during operation prevents shock and its sequelæ. As an emergency measure in patients

whose energies are flagging, diathermy almost equals blood transfusion for temporary relief.

*Vomiting and Distention.*—Under gas and oxygen, or open ether with morphine, vomiting rarely complicates abdominal operations, according to H. J. Paterson (*loc. cit.*). Sometimes after gas and oxygen there is some vomiting for about 12 hours. This is controlled by **chlorodyne**, 5 minims (0.3 c.c.) every hour up to 30 or 40 minims (2 or 2.6 c.c.). Vomiting is less common with the patient propped up in the **Fowler position**. The head should be turned to one side, a pillow having been placed under the opposite shoulder. If vomiting due to the anesthetic persists, a good drink of warm water containing 20 grains (1.3 Gm.) of **sodium bicarbonate** should be given. If this fails, the **stomach** may be **washed out**.

H. S. Dolan (Can. Med. Assoc. Jour., Apr., 1927) finds that in established, severe post-operative vomiting in cases with acetone and diacetic acid in the urine, **glucose** and **insulin** are decidedly beneficial in a dosage of 500 c.c. (1 pint) of 10 per cent. glucose solution intravenously and 10 units of insulin hypodermically. In cases where lesser degrees of vomiting are both distressing and dangerous to the general state of not too robust (*e.g.*, sanatorium) patients, similar treatment has decided prophylactic value. For this purpose, 100 c.c. (3½ ounces) of **orange juice** by mouth and 5 units of insulin hypodermically are given ½ hour before anesthesia. Three hours after operation, 100 c.c. of 20 per cent. glucose solution is given hypodermically and intravenously. Vomiting in general peritonitis was treated similarly

with some striking results. In all cases of severe post-operative vomiting the blood chemistry should be studied. Where the blood chlorides are low, striking improvement follows the intravenous injection of **chlorides**.

In determining whether persisting post-operative *distention* is due to mechanical obstruction or a paralytic ileus, F. H. Lahey (Jour. Amer. Med. Assoc., Nov. 19, 1927) bears in mind that distention due to obstruction low in the ileum is low in the abdomen, usually with the upper abdomen flat; in obstruction higher in the ileum, the distention is more marked on the left side; in paralytic ileus, distention is, as a rule, general and symmetrical, and the localizing peristaltic cramps often attending small intestine obstruction are lacking. When cramps occur in adynamic or presumed paralytic ileus, if gas is not soon passed with **enemas** and other measures, mechanical obstruction should be suspected and measures taken to relieve it. In general, exploratory secondary operations on patients with marked distention are most serious procedures. Cecostomy is of little value. In distention that is not mechanically obstructive, non-operative measures to start the passage of gas may be reasonably persisted with up to 4 days. Beyond that time, it will usually be found due to peritonitis or localized inflammatory accumulations. Where doubt exists and an enterostomy is decided on, an incision high in the left hypochondrium with an **enterostomy** in a high loop of jejunum by Witzel's method, bringing the catheter out through the omentum (Mayo) is the best procedure. In prolonged ileus,



all measures should be taken to combat toxemia, with intravenous administration of normal or slightly **hypertonic salt solution** combined with **dextrose**. In suspected inflammatory accumulations causing distention, delay and observation will result in eventual demonstration of the mass and permit its safe and adequate **drainage** without danger of diffusion.

In ileus, Crile and Higgins (*loc. cit.*) advise an early **ileostomy**, without waiting until the condition is critical. This procedure may be performed rapidly, under local anesthesia, in the patient's room. Frequent **saline infusions** and **blood transfusion** are useful.

**Pituitary extract** may be given if the obstruction is not mechanical in type, and likewise **magnesium sulphate enemas**.

**Hiccup**.—In this complication Lahey (*loc. cit.*) has had very gratifying results from **carbon dioxide inhalation**. No special apparatus is required. A small funnel is attached to a tube leading to an ordinary tank of carbon dioxide. The valve on the tank is turned just far enough to give a distinct odor of the gas which emerges. The patient inhales the gas from the funnel until a mild hyperpnea results. The hiccup usually stops after 8 or 10 breaths. It may recur after an interval, when the procedure may be repeated.

**Gastric Dilatation**.—This complication may be practically eliminated, according to Crile and Higgins (*loc. cit.*), by the following procedures: Before any gastric operation, **gastric lavages** are given, and a soft diet allowed until the day before operation, when a liquid diet of high caloric value is administered. On the morning of op-

eration gastric lavage is again practised and a **duodenal tube** passed. Adequate hemostasis by a hemostatic suture when the anastomosis is performed serves to keep the stomach free from blood.

The acute dilatation sometimes attending *arteriomesenteric obstruction* may be treated by turning the patient on his side, or on the abdomen, if necessary, thus freeing the duodenum from the tension of the mesentery. Early recognition of the condition and repeated passage of the stomach tube will often relieve it. **Pituitary extract** may also be of value. **Saline infusions** should be given to maintain the chloride content of the blood.

**Alkalosis**.—This condition, as stated by W. Thalhimer (Jour. Amer. Med. Assoc., Nov. 26, 1927), is even commoner than post-operative acidosis, and may occur either before or after operation. It occurs as a result of intestinal obstruction, at times only partial, and whether the ileus is functional or mechanical. The symptoms of alkalosis are at times not unlike those of acidosis, and the former is best detected by determination of the blood chlorides, which are lowered, and of the blood non-protein nitrogen, which is raised. The treatment consists of generous use of **sodium chloride**, given subcutaneously or intravenously, in about a 3 per cent. solution, until the blood chlorides are back to normal; they should be kept normal until the patient is well on the road to recovery. Sometimes 2 liters (quarts) of the solution have to be given intravenously in 24 hours to accomplish this. This treatment cures many patients, aids many more, and lengthens the lives of all, even those with peritonitis.

*Acidosis.*—Crile and Higgins (*loc. cit.*) state that in intracellular acidosis in elderly patients with chronic nephritis and an elevated blood urea, remarkable improvement may result from the intravenous administration of **Fischer's solution**, 550 c.c. (18 ounces) twice a day, and of a 10 per cent. solution of **dextrose**.

*Bronchopulmonary Complications.*—Statistics show that 1 patient in about 200 of those operated upon will die of a lung complication. The incidence of such complications, however, as emphasized by L. F. P. Sise (*Anesth. and Analg.*, Aug., 1927), varies markedly with the site of operation, being roughly 0.5 per cent. for operations on the extremities, 1 per cent. for lower abdominal operations, and 10 per cent. for upper abdominal operations. Following are statistics from the Lahey Clinic, Boston, for the years 1924-25:

Operation	No. of Operations.	No. of Lung Complications.	Per Ct
Gall-bladder .....	119	7	5.9
Stomach .....	27	4	14.8
Intestines .....	39	3	7.7
Appendix .....	179	3	1.6
Hernia .....	59	8	13.6
Exploratory Lapa- rotomy .....	31	1	3.2
Pelvic .....	147	1	0.7
Chest .....	39	0	0
Head and Neck .....	100	0	0
Extremities and Mis- cellaneous .....	258	3	1.2
Thyroid .....	1138	9	0.8

The unusually high figure for hernias Sise finds hard to account for; there were, among the 8 cases, 3 of pneumonia, 2 each of embolism and massive collapse, and 1 of bronchitis, none fatal. The incidence of lung complications is 2 to 3 times as great in men as in women.

All forms of pneumonia may occur post-operatively, but the commonest form, to which the term *post-operative pneumonia* is especially fitting, differs greatly from the ordinary croupous pneumonia, being much milder, briefer, with signs of lobular consolidation, absence of rusty sputum, and practically no mortality except in the debilitated or with other complications. This form is nearly always due to the Type IV pneumococcus. *Massive collapse of the lung* seems to be more frequent than had been thought. Its essential features are unilateral dullness with displacement of the heart toward it. Voice sounds and fremitus are usually diminished at first over the dull area and then tremendously increased. The X-ray may be necessary for diagnosis in the milder degrees. According to some, small areas of collapse are present in some degree in practically all post-operative lung complications.

The causes of lung complications, in Sise's opinion, are restriction of respiration and cough, infection, embolism, and aspiration. Chilling and general anesthesia, especially ether, are contributory. The fact that 21 out of 22 cases in which definite respiration infection was present at operation nevertheless escaped lung complication shows that some factor other than infection is necessary to precipitate the disease. The theory that an embolus with its resulting infarction when lodging in an area of atelectasis precipitates infection is not yet proven; the fact that embolism is somewhat commoner in gynecologic than in stomach operations, while pneumonia incidence is considerably lower in gynecologic operations, seems against it. Cases

of bronchitis or pneumonia due to aspiration of foreign material are few even with poorly conducted anesthesia. The incidence of lung complications according to anesthetics at the Lahey Clinic was 3.1 per cent. for ether; 1.8 per cent. for gas-oxygen, and 7.5 per cent. for local anesthesia. This agrees with Lundy's figures of 3.6 per cent. of bronchopneumonias under open ether and 1.5 per cent. under ethylene-ether. The high incidence under local anesthesia may be due to the frequent use of local in the aged, weak and cachectic and in subjects with respiratory infection.

G. P. Müller (*loc. cit.*) records 1.1 per cent. of lung complications among 4073 operations in the University Hospital, Philadelphia. There was 1.4 per cent. for ether cases, 0.9 for local anesthetics, 0.7 for ethylene and 0.6 for nitrous oxide. The complications consisted of acute bronchitis, 10 cases, no deaths; bronchopneumonia, 15 cases, 7 deaths; lobar pneumonia, 6 cases, 3 deaths; pulmonary embolus, 11 cases, 4 deaths; lung abscess, 3 cases, 3 deaths; massive collapse, 1 case, no death. The total mortality was thus 37 per cent., and this constituted about 10 per cent. of the whole mortality of the service.

The late inflammatory lung complication, occurring usually on the 8th to the 12th day after operation, is discussed by L. R. Chandler (*Cal. and West. Med.*, Sept., 1927). There is a sudden onset, with pain which is sometimes persistent, a moderate fever (usually of septic type), an area of consolidation in any part of the lung, and recovery by lysis. This condition is frequent after abdominal or pelvic operations and operations on the throat, mouth or neck, and is often accompanied or followed by empyema or lung abscess. During the interval between the operation and the onset there is frequently a slight fever, seldom exceeding one degree.

According to Mastics, Spittler and McNamee (*Arch. of Surg.*, Aug., 1927), reporting 50 cases of post-operative pulmonary *atelectasis*, partial or massive, this complication is a common one. No doubt the majority of cases of supposed aspiration or post-operative pneumonia, bronchitis or bronchopneumonia have been cases of atelectasis. F. J. Smith and E. C. Davidson (*Mich. State Med. Soc. Jour.*, May, 1927), referring to 7 cases, all of which promptly recovered, mention as the usual course in such cases a sharp onset within 24 or 48 hours after an abdominal operation, with a few days of decided thermal reaction, tachypnea and tachycardia, slight cyanosis, and unilateral consolidation and heart displacement. The evolution is rapid and quite unlike either lobar or bronchopneumonia.

Lahey (*loc. cit.*) states that 2 factors play an important part in the high incidence of lung complications after upper abdominal operations, *viz.*, (1) atelectasis in the portion of lung just above the elevated diaphragm, as revealed by X-ray especially after gall-bladder operations, and (2) reduction in vital capacity due to voluntary shallow breathing to minimize pain. These factors, seemingly, can be offset by inducing deep breathing with **carbon dioxide inhalations**. These are begun on the afternoon of the operation and given 3 times daily through the third post-operative day. Enough of the gas should be given each time to produce a definite hyperpnea, which usually takes 5 to 10 minutes. This procedure is not objectionable to patients, and is believed by Lahey and Sise to have definite prophylactic value.

**Autohemotherapy** was employed by Corachán, Pi y Figueras and Trueta (*Anal. del Hosp. Sta. Cruz y S. Pablo, Barcelona*, July 15, 1927; *Jour. Amer. Med. Assoc.*) in the treatment of bronchial and pulmonary complica-

tions following operations. Generally, there was almost immediate improvement, and of 18 cases only 1 died. The amount of blood injected was usually 25 or 30 c.c., occasionally 50 c.c. The blood was obtained from an elbow vein and injected directly without citration, etc.

W. Meyer (Amer. Jour. of Surg., Aug., 1926) quotes Bier as having found **ether injections** of value. In 185 out of 187 cases, when a patient developed symptoms of bronchitis due to ether anesthesia and was given without delay 8 minims (0.5 c.c.) of ether in an equal amount of sterilized olive oil intramuscularly, to be repeated once in 24 hours if necessary, the development of pneumonia was prevented. According to animal experimentation, ether produces an acute hyperemia within the bronchi and their divisions, with an increased discharge of mucus, making the bronchial secretion more liquid. Usually in 4 to 6 days the danger of pneumonia is averted. The same measure has been found of advantage in typical chronic bronchitis.

*Peritonitis.*—Crile (*loc. cit.*) states that this complication may be avoided, or its course abated, by limiting the primary operation strictly to the procedure necessary to provide adequate dependent drainage, and by institution of the **Alonzo Clark treatment**, *viz.*, giving **morphine** in sufficient doses to hold the respiratory rate below 18 per minute. The major operative procedure—identification and removal of the focus of infection—may then be postponed until the stormy period is past.

*Psychosis.*—In the insanity which follows a small percentage of operations under anesthesia, according to Gilbert Brown (Amer. Jour. of Surg., Apr., 1926), an insane heredity is present in some cases; where it is absent, there is often a predisposition

from toxemia, exhaustion or allied states. The incidence is slightly higher after operations on the genital organs. The sexes are affected in equal proportion. Insanity immediately following operation is due to the anesthetic, while that occurring after several days is due to the operation itself. Complete recovery usually takes place within 3 months; some patients, however, die within a few days, and a small percentage never return to normal.

*Adhesions.*—Making it a practice in opening the abdomen of a patient who has had a previous operation to explore by palpation under the old scar, G. A. Sloan (Surg., Gyn. and Obst., Nov., 1927) has never yet found more than slight adhesions to the scar where cholecystotomy had been done through a very short or stab wound. Under scars from incisions of 3 inches or more in the upper abdomen, on the other hand, dense adhesions were always found. Obviously, for at least 10 days after operation the lateral tension on the suture line must produce irritation leading to an inflammatory reaction both in the aponeurosis and underlying peritoneum. In all cases the omentum was found to become adherent to peritoneum which is inflamed. For the prevention of adhesions, an incision must be used that does not destroy the nerve supply of any portion of the peritoneum and that can be closed without tension upon the sutures in contact with, or through, the peritoneum. This plainly cannot be done unless the fascia fibers remain intact. The **transverse incision** meets this requirement and also gives ample exposure. It can be relieved of tension by proper posture.



The majority of patients with adhesions, as stated by J. E. Adams (Practitioner, Nov., 1926), are ignorant of their presence. In general, inter-intestinal adhesions cause pain only in so far as they interfere with peristalsis. Those involving the parietal peritoneum may, however, be painful almost from the start. If adhesions press or drag on the abdominal wall or mesenteries, pain is likely to occur. While the diagnosis of adhesions is usually made by inference, in certain cases they may be shown by the X-rays after inflation of the peritoneal cavity with oxygen. A lateral or oblique skiagram may show isolated bands in the distended cavity. This method is somewhat uncomfortable for the patient, and should be used only in cases of special difficulty.

In all operations loss of heat, loss of moisture and contact with rough surfaces must be avoided. **Omental grafts**, attached or detached, may be of the greatest service. If raw areas are inevitable on the surface of the intestine, a serous covering may be borrowed from the mesentery. The introduction of protective membranes or lubricants into the peritoneal cavity is ineffective. The writer holds that the influence of peristalsis in preventing adhesive peritonitis is shown in that it is quite difficult to secure adhesions between foreign bodies and small intestine. Also, it is extremely difficult to produce inter-intestinal adhesions by insulting the serous coat of small intestine. **Pituitary extract** and **physostigmine** are the most reliable substances for prophylaxis by peristalsis, and rarely fail to be of use clinically. Adams's practice after the operation of **entero-**

**clysis** is to begin pituitary extract, 1 c.c. (16 minims), the next day and repeat it daily for 3 or 4 days and then every other day for a week. **Physostigmine salicylate**,  $\frac{1}{40}$  grain (0.0015 Gm.), may be used similarly, and both these drugs may be combined with **liquid petrolatum** by mouth. This may be given before the operation, and twice daily, in  $\frac{1}{2}$  ounce (15 c.c.) doses, as soon after as the patient can take it.

According to D. H. Bessesen (Med. Jour. and Rec., Apr. 7, 1926), on the other hand, the view that a highly activated alimentary tract before and after operation will prevent adhesions is misguided, since such stimulation produces hyperemia with its concomitant regenerative activity and increased tendency to cicatricial production. Drainage should be limited to thin strips of soft rubber, Penrose drains, or the Gibson tampon pack in severe infection. The proper position for drains is against the abdominal parietes, not into the loops of viscera. Post-operative **enteroclysis** of 5 per cent. **glucose** or **saline solutions**; **heat**, especially dry, in the form of a light, applied over the wound, and careful **diet**, with caution as to foods that may cause intestinal disturbance, are important early measures. Later, **massage**, **exercise** and **belts** may be advised in individual cases. A good method of massage is **rolling of** a small bowling ball around the abdomen clockwise. In operating for adhesions, only such adhesions as are causing the immediate trouble should be disturbed. Changing the patient's position will reveal these adhesions more clearly. A correct and complete closure should be carried out. After operation, **postural**

**treatment** is an important adjunct. **Injecting oxygen** into the abdomen keeps the abdominal wall lifted away from the viscera while healing of each area progresses.

In operating for adhesions, H. J. Whitacre (Northw. Med., Nov., 1926) first studies the effect of each adhesion. Each band is painstakingly clamped, not torn, and tied without trauma to the peritoneal covering of that part of the band that is to be left behind. In the right upper quadrant the separation of adhesions invariably leaves raw surfaces on the surface of the duodenum, on the pylorus, over the duct system and under the liver. Sometimes there are **peritoneum-covered tags** or **flaps of omentum** close by that may be used to cover these areas, and No. 00 plain catgut is employed to hold a flap accurately in the desired position. When no tissue is available, a free **omental transplant** is gently removed and sutured with greatest care over the raw areas. This transplant is often 3 by 6 inches in size and covers the entire duodenum and pylorus. It is important accurately to suture the upper edge of the transplant over and around the duct system in the region of the foramen of Winslow and to the posterior parietal peritoneum in the kidney pocket. The results from this method of treating adhesions have been very gratifying.

**POST-OPERATIVE TREATMENT.**—*Posture.*—Having witnessed serious bronchopulmonary complications from aspiration of vomitus during or after operation, Willy Meyer (Amer. Jour. of Surg., Aug., 1926) urges, during the operation, the immediate placing of the patient in a **slight Trendelenburg posture** before vomiting has actually started, *i.e.*, when the first contractions of the diaphragm and the premonitory motion of the abdomen and thorax are noticed. After operation, on the

stretcher and when the patient is in bed, **Sims's posture** is to be instituted as a routine, so that aspiration of vomitus cannot occur. H. J. Paterson (Practitioner, Aug., 1925) recommends that, when put back to bed, patients who have had abdominal operations be propped up at once into the **Fowler position** with  $\frac{1}{2}$  dozen pillows or a bed-rest. At night they may be turned partly on one side, and after 3 or 4 days may, if preferred, lie on the side during the night. Except in septic and suppurative cases, it may be advisable to keep the patient lying flat for a few hours after operation if there is severe shock.

*Conservation of Temperature.*—The great importance of protecting the liver function by maintenance of temperature during and after operation has been pointed out by G. W. Crile (Surg., Gyn. and Obst., Feb., 1926). When the temperature of the liver is reduced 1 degree its chemical activity is reduced 10 per cent. Where this activity is already low because of the exhaustion incident to disease, *e.g.*, in cancer of the stomach, such reduction of temperature may inevitably cause death. After operations in feeble and aged patients, and after especially wide and prolonged exposure of the upper abdomen, Crile administers repeated doses of **diathermy** through the bases of the lungs, this being the area where post-operative pneumonia is initiated. Instead, an effective method of maintaining the temperature of the whole organism and accordingly promoting circulation and general metabolism consists of passage of the diathermy current through the whole body by applying the terminals to the feet. This is done before the patient leaves

the operating room, and the diathermy apparatus is then wheeled beside or behind the surgical carriage to the patient's room. Comparable effects can be obtained with the **Alpine** or **quartz mercury lamp** when applied to anemic and cachectic patients with lowered general resistance.

*Pain.*—Dean Lewis (Boston Med. and Surg. Jour., May 20, 1926) states that in the ordinary case of appendicitis, without peritonitis,  $\frac{1}{4}$  grain (0.015 Gm.) of **morphine** may be given when the patient reaches his room. Liquid diet is continued for 4 days. An ounce (30 c.c.) of castor oil may be given on the 4th day, and soft diet commenced shortly after. The stitches are removed on the 7th day, and if a muscle-splitting incision has been used, the patient may be up on the 7th day, and leave the hospital on the 8th. Backache may be troublesome. To avoid it, the table must be properly padded and every effort made to see that the long muscles of the back are not too much relaxed during the operation. A small pad under the lumbar spine may help. **Raising the head of the bed** or placing the **patient upon the side** relieve many cases. The so-called gas pains seem to be due to segmental inactivity of the intestines. **Morphine** may relieve. Cathartics frequently increase these pains, while an **enema** often gives relief. A **rectal tube** is of value, and an **electric pad** to the abdomen is frequently promptly effective.

According to H. J. Paterson (Practitioner, Oct., 1926), by far the commonest source of pain after abdominal operations is intestinal colic with flatulent distention. This observer has given up both pre-operative purgation and the enema, and

uses only **liquid petrolatum**, 2 table-spoonfuls every night and 1 in the morning for some days before operation. The petrolatum used must be of high specific gravity and high viscosity. A tablespoonful is given on the night of the operation, another the next morning, and the full dose on the second night and continued thereafter. This treatment usually obviates all trouble with the bowels. If, however, they have not acted naturally by the 4th day, an **enema** may be given.

Pain may also be due to the patient's position or to undue tightness of the bandage or sutures. The writer finds analgesic drugs generally unnecessary; but if pain be so severe as to require treatment, 6 grains (0.4 Gm.) of **acetylsalicylic acid** every 6 hours up to 30 grains (2 Gm.) or a dose of **trional** are the least harmful remedies. In nervous, hypersensitive patients a hypodermic **injection of sterile water** often acts like a charm.

*Administration of Fluids.*—As noted by D. Lewis (*loc. cit.*), water may be given by the mouth as soon as the patient awakes, unless there is a distinct contraindication. Nausea may be controlled by it; if the patient vomits, it may be given again, for it dilutes and removes the ether excreted into the stomach. If water by mouth is not retained, it should be given by the **drip method**. If the patient is dehydrated, **salt solution** may be given **intravenously**, or if acidosis threatens, a **glucose solution** combined with **insulin**. Hypodermoclysis in the pectoral region is painful and not indicated in most cases.

Paterson (Practitioner, Aug., 1925) deems continuous **saline proctoclysis**

of high value as routine treatment for 48 hours after abdominal operations. The largest size rubber rectal tube should be used. The douche can, containing 4 to 5 pints of saline solution kept at 125° F., is raised 4 to 8 inches above the bed, so that the fluid will enter at the rate of 1 pint an hour. After 1½ pints have been given, the flow is stopped, but the rectal tube not removed, and the flow started again after a ½-hour interval. After some hours it may be necessary to diminish the rate of flow or lengthen the intervals. The temperature regulation requires constant attention, an apparatus made with an electric heater proving serviceable in this connection. The temperature of the saline as it enters the rectum should be just over 100° F.

According to L. Lurz and F. Rupp (Münch. med. Woch., May 29, 1925), *thirst* is not adequately relieved by giving isotonic solutions, as they fail to remedy the disequilibrium between the fluid and the salt contents of the body. Whereas much water is lost in the first few days after operation, there is practically no loss of salts. Instillations of **water** or **tea** are therefore preferable, favoring diuresis while allaying thirst by lowering the concentration of chlorides. On the other hand, E. P. Richardson (Boston Med. and Surg. Jour., Aug. 11, 1927) urges the fact that where there is loss of chloride and base from the blood, *dehydration* goes much further than it could otherwise, leading to a concentration of protein in the blood and various other effects. The prevailing habit of giving tap water by rectum after operation may correct dehydration, but is not suited for patients who have been *vomiting* and thereby losing chloride and base. In such cases it is important to give **normal saline solution** by **proctoclysis** or **subpectorally**, and not rely on water alone. In *intes-*

*tinal* and in *pyloric obstruction* large amounts of salt are lost in the vomitus and poured into the intestine. Salt is best supplied by normal saline and not by a hypotonic solution, as sometimes advocated; the normal saline gives opportunity to the patient to reject through the urine the constituent not needed—water, chloride or sodium base.

*The Balkan Frame.*—With a colostomy wound anteriorly and an extensive Kraske wound with bulky dressings posteriorly, weight-bearing is possible for the rectal cancer patient only on the right or left side, the trochanters of the femur sustaining the principal burden. Intractable aching soreness develops in the hips and legs and finally the entire body, with sleepless nights and mental depression. A. C. Johnson (Surg., Gyn. and Obst., June, 1927) has found valuable under these circumstances a Balkan frame fitted above the bed, to which frame is attached by cords a swinging cross-bar within reach of the patient's hands. This enables the patient to raise and turn the body at will, easily assume new positions, and rest tired muscles. Marked physical and mental benefit was noted from this device, with return of appetite and better preservation of muscle tonus.

### ABDOMINAL CONTUSIONS.

—Contusions of the abdomen are grouped by K. Emerson (Boston Med. and Surg. Jour., Aug. 11, 1927) into the 3 types: Blows, falls and crushing accidents. In crushing injuries there are more likely to be bony injuries, and at times the exact location of the traumatizing force can be more accurately determined. Lesions of the viscera are far more apt to occur where the victim is taken un-



aware and has not sufficient warning to throw his abdominal muscles into a protective state of contraction, as in the sudden industrial accidents. A man struck in the belly by a flying plank and rendered unconscious later stated that he had no recollection of the blow. A seemingly moderate blow during sleep may have unexpectedly grave consequences. On the other hand, a heavy cart or automobile may pass over the abdomen with little damage, due warning having been given.

Shock may be assumed to be nearly universal, and its symptoms are confusingly like those of hemorrhage. In the shock, however, the leucocyte count is not altered, while it is usually raised in case of hemorrhage or extravasation of visceral contents. According to Sherman, agonizing pain without any remission suggests injury to mesenteric vessels. Coffee ground vomitus would be taken to indicate stomach trauma, but in a case of rupture of the liver seen by the writer, typical vomiting of this character existed, while operation revealed the stomach intact peritoneally, the trauma apparently sufficing to cause bleeding from the mucosa.

Shock and hemorrhage may be delayed in onset. A boy of 18 run over by a slowly moving touring car showed no signs in both chest and abdomen of serious injury at first, but 8 hours later was in collapse, with vomiting of what appeared to be blood, intense pain and rigidity, and some distention. Immediate operation disclosed a ruptured liver with enormous hemorrhage. Recovery followed the operation and repeated transfusions. This shows the importance of having a case of possible ab-

dominal injury under minute observation for a considerable period.

As an indication for operation, muscular rigidity holds its place among the most important guides, in spite of its occasional ability to lead one astray, as illustrated in one of the writer's cases.

Serious damage to the chest may give rise to the very characteristic symptoms of acute traumatic abdomen.

According to A. Krecke (Münch. med. Woch., Nov. 26, 1926), the costal type of breathing without participation of the abdomen is an important sign of injury to abdominal organs. Tenderness of Douglas's pouch is useful as a positive sign, but its absence does not exclude injury. Vomiting, fever or high pulse-rate may be absent. In case of doubt, examinations should be repeated at short intervals or a small exploratory laparotomy carried out. If operated on in the first few hours after injury, 80 per cent. of the cases recover.

Injury to the *liver* or *spleen*, as emphasized by J. M. Birnie (Boston Med. and Surg. Jour., Apr. 21, 1927), is usually from an object which extends its force across the entire upper abdomen, while rupture of the intestines is from one which exerts its force over a rather limited area. In rupture of the spleen the alarming symptoms may be much delayed from the time of injury. Balance's sign is of some importance: The profuse accumulation of blood settling into the left loin, percussion elicits dulness in the left flank with resonance in the right flank. Now if the patient is turned on his right side, the fluid portion of the blood will gravitate to the right, but the large clots will not, and dulness will persist in the left flank. When he is

then turned on his left side, the fluid flows back and the right side is tympanitic.

F. B. Lund (Boston Med. and Surg. Jour., Aug. 11, 1927) notes that a kick by a horse or mule, or the sliding of a board off a circular saw, if followed by shock and spasm of abdominal muscle, almost always means rupture of the intestine. Realization of this fact has enabled him to operate successfully where the symptoms were very slight.

For an accurate working diagnosis, the onset of new symptoms, rise in pulse-rate, change in the temperature, and increase or decrease of muscular spasm must all be frequently and carefully noted, according to A. M. Dickinson (Amer. Jour. of Surg., Jan., 1927). Vomiting usually occurs soon after injury, is persistent, and in intestinal rupture is present almost without exception. With reaction from shock, fever is to be anticipated. Localized acute tenderness is usual before the spread of peritoneal irritation. Spasm and rigidity appear quite promptly and do not yield to morphine. In the later stages abdominal distention takes place. Free fluid—blood, feces or peritoneal exudate—may be discovered in the flanks. In injuries to the jejunum, symptoms are frequently delayed for hours. It is not generally recognized that a true *traumatic ileus* can follow abdominal injuries. Again, in one of the writer's cases, that of a boy of 12 who had fallen 30 feet, extensive *subperitoneal hemorrhages* were alone found at operation, recovery following. Baker (*ibid.*) suggests that the most important evidence of rupture of the stomach or bowel is pneumoperitoneum, as very definitely and early shown by roentgenography.

The pain in the right and left shoulders in injuries of the liver and spleen, respectively, will continue as long as active bleeding goes on, according to W. E. Gabe (Jour. Ind.

State Med. Assoc., June, 1927). In liver injury there is frequently pain on breathing and grunting respiration, liver tears being usually on the superior surface, where movements of the diaphragm cause discomfort. Extravasation of bile may result either from injury of the larger bile ducts or oozing from the torn surface of the liver. In some recorded cases there was no hemorrhage following a liver tear, but only an outpouring of bile. This does little harm as the bile is usually sterile. De Quervain states that in cases showing only bile in the abdomen the dulness develops much more slowly than in hemorrhage and may even be absent, the bile often collecting in the lesser peritoneal cavity behind the stomach. These patients are usually jaundiced. If the stools are of normal color, the larger bile ducts may be assumed to be uninjured. As a final, almost infallible diagnostic resource as regards hemorrhage in abdominal injuries, aspiration should be used; it will prove the presence or absence of free blood and settle the question whether immediate operation is indicated.

Injuries of the *pancreas* in abdominal trauma are more common than is generally thought, according to Courboulès (Lyon chir., xxiii, 91, 1926). Where this organ alone is injured there may be no special symptoms at first and diagnosis be impossible until later when a pseudocyst of the pancreas develops. The latter result was noticed in a case of football injury seen by the writer, operated on after several weeks of rapid emaciation subsequent to the accident; a pancreatic fistula followed the operation. **Marsupialization** is the only possible treatment where a pseudocyst occurs. Instead of being thus secondary, a pancreatic fistula may be primary, as in a reported case of traumatic hernia of the stomach with

internal hemorrhage, rupture of the pancreas and fistula. A fistula forms sooner or later in all pancreatic ruptures.

Aumont and Grégoire (Bull. Soc. nat. de chir., lii, 1055, 1926) report a case of abdominal contusion resulting from an automobile accident in which the distal 20 centimeters of the ileum was found torn from the mesentery and an irregular tear noted in the mesentery of the ascending colon. Recovery followed **resection** of the injured portion of ileum and the proximal half of the colon. A **Mikulicz drain** was used to control diffuse hemorrhage from the posterior abdominal wall.

An unusual injury is recorded by H. B. Eisberg (Amer. Jour. of Surg., Apr., 1927). In a boy who fell on his abdomen while hitching on an automobile, small intestine appeared through the anus. Laparotomy showed a loop of ileum 60 centimeters long torn from its mesentery, which passed through a rent in the mesosigmoid from right to left and downward through a tear in the posterior parietal peritoneum. The same loop passed downward behind the rectum, which was stripped from the hollow of the sacrum and had a tear 5 centimeters long slightly above the anal margin, through which the loop passed and protruded from the anus. Post-mortem study showed a fractured left acetabulum and 5th lumbar vertebra and a partial sacro-iliac dislocation. The tearing of the gut from its mesentery, the rent in the mesosigmoid and the tear in the rectum are thought to have occurred simultaneously at the time of the accident. The anal sphincter being dilated from shock, the detached bowel followed the path of least resistance, through the anus.

Gabe (*loc. cit.*) relates the case of a woman about 4 months pregnant who fell in her bathroom, striking the lower abdomen against the sharp edge of the porcelain wash basin. She went into profound collapse imme-

diately and was taken to the hospital in a serious condition. Laparotomy revealed the *uterus* split open along its anterior aspect, with the placenta in the depths of the wound. There was free blood in the abdominal cavity. The uterus was **sutured** and the abdomen closed. She did not miscarry, and later gave birth to a full-term baby.

**TREATMENT.**—The treatment in non-penetrating wounds is first directed to combating shock. **Heat, morphine** and **rest** are important measures. If not incompatible with the shock, a **modified Fowler position** is favored by A. M. Dickinson (*loc. cit.*). Fluids must be administered by rectum, subcutaneously or intravenously. Warm **saline solution** is probably best. In the cases with more profound shock, **glucose** and **insulin** are indicated, the former obtained from sterile ampoules each containing 10 Gm. (2½ drams) in 20 c.c. (5 drams) of solution. This may be given intravenously without dilution or, if greater fluid volume is desired, in saline solution. The total volume of intravenous solution should be limited to 500 c.c. (1 pint), to be given slowly, lest cardiac dilatation be induced. Insulin, 1 unit to 3 Gm. (45 grains) of glucose, is given in the usual manner. Half the required dose of it should be given just after starting the intravenous injection and the remainder at the end. In the more serious cases, **transfusion of whole or citrated blood** is exceedingly valuable.

Persistent vomiting and a rising pulse rate are sufficient to demand exploration. The majority of cases stand surgery well after reacting from the shock. If, after observation for 2 hours, the general condition has not improved and symptoms of in-

ternal hemorrhage are present, **laparotomy** should be performed in spite of the presence of shock. Speed is essential, but secondary to safety. Mere **packing** of a lacerated liver or kidney may be all that one can do; if the damage is to the intestine, **resection** and **enterostomy** rather than **anastomosis** may be advisable. The omentum is useful as a tampon for hemostasis or to reinforce suture lines. When the injury is to a solid organ, with considerable hemorrhage, the blood should be left in so that it can be absorbed. When operation is delayed for 48 hours and there is evidence of hemorrhage, one must proceed cautiously, as the sudden relief of intra-abdominal pressure on incision is apt to start up brisk and oft-times fatal hemorrhage.

In *injuries of the liver*, sometimes hemorrhage can be controlled only by **tamponing with gauze**; in others the **omentum** may be used as a natural **tampon**. **Suture** of the friable liver can be effected by careful use of blunt needles and large-sized suture material. The use of **drainage** depends upon the amount of uncontrolled oozing and the presence of free bile.

In *injuries of the kidney*, catheterization of the bladder is dangerous because of the likelihood of infection; infection of even a slightly damaged kidney may make nephrectomy necessary. Operative treatment should be conservative, as fatal hemorrhage can probably not occur unless the renal artery or vein is torn. Immediate **operation** should be performed if the patient fails to react from shock. The indications for operation are an enlarging tumor in the loin, persistence of anuria for 24 hours, and later,

signs of beginning sepsis. In most instances simple **suture**, with or without **packing**, is sufficient.

Rarely is primary **nephrectomy** indicated. Later, nephrectomy may be necessary because of prolonged bleeding or sepsis.

In a case of *torn spleen* treated by **splenectomy**, Bradley Coley (Amer. Jour. of Surg., Jan., 1927) employed **autotransfusion**. With a small sterile cup 700 c.c. of blood was bailed out of the man's abdomen into a basin. To it was added all the blood that could be squeezed out of the laparotomy pad, and he was given a transfusion of over 700 c.c. of his own blood during the operation. The man's recovery, if not entirely dependent upon this transfusion, was largely aided by it. In wounds of the *liver* **tight packing** and **autotransfusion** might save some cases. Often they die before one can start transfusion from a donor.

J. H. Gibbon (Boston Med. and Surg. Jour., Aug. 11, 1927) maintains that any packing put in a tear or incision or gunshot wound of a solid viscus does more harm than good. The bleeding will often stop itself because the surface has been agglutinated, and **packing outside** will do a great deal more towards producing this agglutination than packing inside. Lightly tied **mattress sutures** are better still.

As noted by Gabe (*loc. cit.*), patients with rupture of a solid abdominal viscus should have before operation either **intravenous salt solution**, or better, a **blood transfusion**. The whole prognosis may be changed through this one measure. In case of the liver or spleen, rapid, accurate work necessitates good exposure.



This is obtained by a high right rectus incision or a right rectus combined with a Bevan or subcostal type; the latter has proven best in the writer's experience. He has never seen a subcostal incision of the oblique type followed by post-operative hernia. In *ruptured spleen*, T. B. Noble advocates a **gauze sling** sewed together with plain catgut and placed around the organ tightly enough to stop hemorrhage and cause coaptation. The gauze is brought out through the abdominal wall. The catgut absorbs after a few days, permitting removal of the sling, and the spleen is healed.

**ABDOMINAL PAIN.**—In opposition to the views of Lennander and Mackenzie, that pain is not felt in the viscera, but referred to the somatic tissues supplied by the same cord segment, J. A. Ryle (Lancet, May 1, 1926) adduces evidence to show that (1) there is a true visceral pain felt by the individual viscus; (2) such pain is due to abnormally increased tension of the muscular element of the wall of the viscus, resulting either from contraction or from failure of the muscle-fiber to relax adequately in the presence of increased intravisceral pressures; (3) visceral pain when occurring alone, or dissociable from attendant somatic pains, may be accurately localized by the patient; (4) referred somatic pain and tenderness and the associated visceromotor reflexes, although they may accompany a severe visceral crisis of mechanical origin, more often express an inflammatory lesion of the viscus; (5) when persistent, they invariably express inflammatory organic disease.

In an analysis of 1000 cases of abdominal pain, L. W. Elston (Jour. Ind. State Med. Assoc., June, 1927) found 340 instances, or 34 per cent., attributed to disease of the appendix, including 168 of the chronic recurrent type with an average duration of 16 months. Next to appendicitis came gall-bladder disease, with 113 cases, or 11.3 per cent. Aside from gall-stone colic and acute cholecystitis, the pain in this group was of a heavy, aching character in the epigastrium, as of "a croquet ball" being lodged there. This was equally common, however, under the right rib margin, and almost constantly accompanied by gaseous distention of the upper abdomen, with eructations, nausea and occasional vomiting. Pyelitis accounted for 72 cases of abdominal pain, or 7.2 per cent. Acute pyelitis may closely simulate an acute surgical abdomen. The fever in pyelitis, however, is usually much higher in proportion to the toxicity portrayed than in appendicitis; chills are more common, nausea and vomiting much less frequent; deep pressure over the infected kidney is often more painful than that over McBurney's point, and repeated uranalysis reveals pus or blood. Surgical correction of retroversion of the uterus relieved lower abdominal pain, almost always accompanied by chronic backache, in 68 cases, or 6.8 per cent.

Other observed sources of abdominal pain were salpingitis, 3.8 per cent.; pelvic or lower abdominal peritonitis with abscess formation, presumably from tubo-ovarian disease, 2.5 per cent.; ectopic pregnancy, 0.6 per cent.; hernias, 3.9 per cent.; acute bowel obstructions, 1.2 per cent.; gastric or duodenal ulcer, 2.3 per cent.; ovarian cysts, 2.1 per cent.; urinary tract calculi, 1.1 per cent.; dystocia, 1.4 per cent.; carcinoma of abdominal or pelvic viscera, 3.9 per cent.; tuberculous peritonitis, 0.3 per cent.; post-operative adhesions, 0.9 per cent., and proci-dentia, 0.6 per cent. The remainder was made up of rarer conditions such as urachus cyst, coccygodynia, hyper-

nephroma, tuberculous kidneys, acute inguinal adenitis, thrombosed varicocele, etc. The writer notes that where the resistance of the patient has been lowered from causes such as exhausting fevers or anemia, referred or reflected pains are more apt to occur.

As regards pain in the *right iliac fossa*, H. W. Carson (Lancet, Feb. 13, 1926) asserts that one of the common causes is muscle strain, seen in 2 classes of patients—the young school-girl who strains her oblique muscles owing to a vigorous pursuit of net-ball or lacrosse, and the middle-aged athletic man who is giving up his sports and beginning to put on weight. The girl's pain may easily be diagnosed as appendicitis, as there is often tenderness on palpation. The man's pain is due to commencing inguinal hernia. Trouble in the urinary tract and tuberculous mesenteric glands are other causes of right iliac fossa pain which may lead to diagnostic errors. Ileocecal tuberculosis and cancer of the right colon give rise to an easily detected tumor, but cancer of the left colon often causes right iliac fossa pain owing to back pressure and distention of the cecum when the growth itself cannot be felt. Such pain with distended cecum in a constipated patient over 50 should always suggest a stricture in the left colon.

Some women with the head carried forward and the lumbar spinal concavity abolished complain of constant dragging pain in the right iliac fossa, flatulence, loss of energy, joint pains, neuralgia, nausea, etc. A barium meal shows ptosis of the stomach and large bowel with delayed emptying. These cases have either a thin membrane from the parietal peritoneum across the mesocolon to the intestine

or a tougher membrane constricting the colon somewhat higher up. Yet operations to release bands and fix the ascending colon have not been wholly successful, suggesting some other cause of the trouble.

As for *chronic appendicitis*, its true symptoms are those of "appendix dyspepsia." The pain is epigastric or umbilical, excited by taking food—particularly of certain kinds,—and is never relieved by recumbency. Nausea is more common than in any other chronic indigestion. There is often an associated pain in the right iliac fossa, but this is never the only symptom. Nutrition is not impaired, nor is there anorexia, nor, as a rule, constipation. X-ray examination after a barium meal in diagnosing appendicitis has little value.

The view that the appendix is usually innocent where pain in the *right lower quadrant* is unaccompanied by fever and digestive disturbances is endorsed by H. A. Blaisdell (N. Y. State Jour. of Med., May 1, 1926). The more generally recognized confusions with appendicitis are those relating to the gall-bladder, right tube and ovary, duodenal ulcer, acute pancreatitis, Meckel's diverticulitis, and luetic gastric crisis. Further, in recurrent right abdominal pain, especially in the absence of gastric symptoms, the appendix should not even be accused—still less found guilty—until one has eliminated floating kidney, ureteral calculus, pyelitis and stricture or kink of the ureter. For this purpose the following routine is indicated: (1) Careful history with special reference to gastric, urinary and menstrual symptoms. (2) General physical examination, remembering that not all cases of ureteral obstruction are followed by hydro-nephrosis. (3) Urinalysis, with wet and stained smears of catheterized or sterile, centrifuged specimens. A

sterile sample is obtainable from the male by catching the last portion of urine voided, and in the female after cleansing the vulva and meatus by catching the last portion in a sterile test-tube held over the meatus. All specimens are to be examined at once. Any finding pointing to the urinary tract calls for a complete cystoscopic examination, *i.e.*, ureteral catheterization, functional test and pyelogram.

Pain in the *left upper quadrant*, as noted by J. W. Shuman (Med. Jour. and Rec., Aug. 3, 1927) is often complained of but seldom written about. Gas in the stomach and colon frequently causes discomfort in this location. Posture, as in sitting at the typewriter or sewing-machine, or stooping to weed in the garden, often aggravates the ache. There are also the patients called "air swallowers." A failing heart often causes indigestion with gas and left upper abdominal distress. Other causes of such distress are the unilateral kidney diseases and splenic enlargements (typhoid, malaria, chronic infections, anemias). Splenic infarcts from bacterial endocarditis are common, and may induce splenic abscess. Colon diverticulum is a common disease causing left upper quadrant pain. Syphilis of the liver most often attacks the left lobe. Extrinsic or reflex causes of aches in this quadrant are chiefly diseases of the lung, heart, rectum and pelvis. Intercostal neuralgia, diaphragmatic pleurisy, rib injury, and diaphragmatic or epigastric hernia are possibilities to be remembered.

A persistently normal urine and negative X-ray results do not exclude the kidney or ureter as a source of abdominal pain. In 15 to 20 per cent. of lesions of the kidney and ureter,

according to J. D. Barney (Boston Med. and Surg. Jour., July 15, 1926), chiefly due to calculi, previous operation has been performed without relief for other abdominal conditions, often without previous investigation of the urinary tract. As regards X-ray detection of *ureteral kink*, this observer stresses the value of the ureterogram as distinct from the pyelogram, the ureteral catheter in the latter often straightening out a kinked ureter and thus failing to reveal the kink, while in the ureterogram the ureter is to be injected with the catheter almost completely withdrawn.

Another urologic cause of abdominal pain is *aberrant vessels of the kidney* so placed as to interfere more or less constantly with drainage of the organ. These vessels have recently been recognized by urologists as a frequent cause of hydronephrosis. They are best detected with the pyelogram, though even with careful technic their presence is often only a matter of inference. *Torsion of the kidney*, revealed by the pyelogram, may show little or nothing on physical examination in spite of producing severe abdominal symptoms. *Horseshoe kidney*, occurring once in about 1100 persons, may lead to an operation for appendicitis or almost any abdominal disease. In a case referred to it was detected by bilateral pyelograms and the relief of pain afforded by keeping the body bent forward. Other possible causes of pain are *bifurcation* of one or both *ureters*, *two ureters* on one or both sides, and *bifurcation of the kidney pelvis*. Simple X-ray and palpation reveal nothing; only a very complete cystoscopic examination, with pyelograms

and ureterograms, makes the actual situation clear.

Referring to abdominal pain of *cardiovascular origin*, R. D. Forbes (Northw. Med., Feb., 1927) notes that the clinical picture of *coronary disease* is not yet sufficiently well known to the profession. Though, in coronary disease with anginal symptoms, the pain radiation may be regular, pain is more likely to be referred to the abdomen than in aortic or valvular disease. Often the natural diagnosis would be indigestion, food poisoning or gall-bladder disease.

It is unusual with these patients to find signs and symptoms of heart disease. Such symptoms as they present are vague, variable, and lacking in uniformity.

In *acute coronary obstruction* the severe pain, often lasting for hours or days, may be associated with nausea and vomiting or with complete prostration and at times sudden death. There is usually a pallid cyanosis. No position gives relief. A drop in blood-pressure always occurs and a pericardial friction rub is often noted within a few hours; the liver is enlarged and tender, and jaundice sometimes quickly develops; leukocytosis is found in a few hours and may run up to 20,000, with 82 or 83 per cent. of polymorphonuclears. The temperature always rises, sometimes to 101 or 102° F. With belching, nausea and vomiting, the similarity to perforation of a gastric or duodenal ulcer is obvious. Where the pain is referred to the epigastrium, there is a distinct resistance of the upper abdominal muscles; but this is never board-like. Crackling râles at the bases are found early and persist a long time. In only 2 of the

writer's 5 cases was coronary disease suspected in the first attack.

According to Juaristi (Arch. Españ. de Enf. del Apar. Dig., Aug., 1927), in any abdominal perforation, the presence of free gas can easily be detected by examining the umbilicus by fingertip pressure. Sometimes the navel may project somewhat, but in all cases, when the finger is passed gently backward and forward over the region, a slight gurgling sound is perceived. This sign was found positive in cases of perforated gastric ulcer, intestinal tears caused by the kick of a mule, perforated appendicitis, etc.

A "rising test" in acute abdominal diseases is described by Chapman (Brit. Med. Jour., Oct. 29, 1927). It proved very useful, especially in borderline cases, chiefly appendicitis, in which one might reasonably think of putting off operation for a day or so. The test consists in the patient putting both hands down by the side of the thighs and then raising himself in bed with his abdominal muscles. This causes pain at once, and the patient fails to raise himself or complains of pain in doing so. The test proves positive when there is little or no tenderness in the abdomen. It is an indication of some acute abdominal lesion.

Cases of *migraine* in which abdominal symptoms replace or greatly overshadow the hemicrania are emphasized by N. L. Blitzsten and W. A. Brams (Jour. Amer. Med. Assoc., Mar. 6, 1926), who have seen 32 such cases. Of their latest series of 10 cases, 5 had been operated on without any pathologic findings. There was a family history of migraine in nearly all of the 32 cases. Several patients had hemicrania before or with the abdominal pain. The attacks usually began and ended abruptly, and lasted 1 to 4 days. The typical attack consisted of severe, boring or cutting epigastralgia, without relation to food



or relief by alkalies, food or vomiting. Physical examination showed merely slight epigastric tenderness in a few cases. There was no fever during attacks. In a number of instances there was disappearance of hemicrania and substitution of epigastralgia for it during an attack. In the diagnosis, the abdominal crises of tabes and exophthalmic goiter must be carefully excluded, as also reflex pain from disease of various organs. The abdominal pain is ascribed to a "storm center" involving the region of the nuclei of the vagi, with transmission of the impulse to the sympathetic system. **Cannabis** treatment is sometimes effective. The writer gives 5 minims (0.3 c.c.) of the tincture 3 times a day, increased 1 minim (0.06 c.c.) per dose daily to the point of intoxication, when the dose is decreased by 15 minims (0.9 c.c.) and again increased gradually as before.

A. Goldbloom (Can. Med. Assoc. Jour., Oct., 1926) divides into 2 groups the cases of *throat infection in children* in which abdominal pain is encountered. In the first, and by far the largest group, the pain is the first and outstanding symptom, rarely accompanied by tenderness, and almost never by rigidity. In these it subsides well before the signs in the throat subside, and no diagnostic difficulty is met. In the second group, the pain occurs after the onset, and sometimes after complete subsidence of the throat infection. Here the severity is much more marked, and tenderness, though rarely rigidity, is a feature. These cases could very well fit in with Brennemann's explanation of a mesenteric adenitis, *i.e.*, an inflammation of the abdominal lymph-nodes coexisting with the throat in-

fection, the pain therefore having its origin in actual abdominal disease.

Obscure chronic pain in the back or abdomen in women is ascribed by Sellheim (Monats. f. Geb. u. Gyn., Jan., 1927) to undue mobility of the uterus, the result of inadequate support by a weakened pelvic floor. There is a drag on the ligaments holding up the organ. The pain frequently dates from a childbirth, especially an initial one late in life. It is most often started by change of position from recumbent to upright or by work causing a heightened intra-abdominal pressure. A **plastic operation** on the pelvic floor cures the condition.

**Diathermy** in the treatment of various forms of abdominal pain is extolled by Fraikin (Paris méd., July 24, 1926) on the basis of 6 years' experience. In simple or mucomembranous *colitis with spasm*, the pain and spasm are allayed by 1 or a few diathermic treatments. Where constipation coexists the ultra-violet rays are used in addition. In *omentitis*, *periappendicitis* and *pericolitis* there is often a gradual but distinct and rather lasting improvement. One case of very painful *perisigmoid adhesions* was greatly benefited. In cholelithiasis diathermy may bring on hepatic colic, but in cases of former cholecystitis with *infrahepatic adhesions* and in cholecystectomized patients with *periduodenal adhesions* the measure is valuable. In the many patients with as yet poorly classified inflammatory affections of the duodenum (*duodenitis*), sometimes with mere congestion of the inner coats, at others with ulcerations or fissures and marked reaction by the muscular coat, diathermy often brings about disappearance of pain, nausea and vomiting and a gain in weight. Excellent results are ob-

tained in *duodenal* or *pyloric spasm*. In *imbalance of the gastrointestinal functions* associated with gastroenteroptosis, causing pain in the field of the solar plexus, combined use of diathermy and the ultra-violet rays has given unexpectedly good results.

The writer uses a d'Arsonval-Gaiffe diathermy apparatus, with currents of 1000 up to 2500 milliamperes, according to tolerance. Broad, supple electrodes—25 by 30 centimeters over the back, and covering the whole abdomen anteriorly—are employed, with the posterior electrode resting on a cushion and the recumbent patient holding a cushion over the anterior electrode. The current is increased gradually to the point of gentle, pleasant warmth beneath the electrodes. The sittings, lasting 20, 25 and 30 minutes, are given daily at first, then thrice weekly, up to a total of 20, 25 or 30 treatments.

**ABDOMINAL WOUNDS.**—The path of a bullet through the abdominal cavity may be erratic and cannot be judged by its path of entry through the abdominal wall. In the case of a small boy who shot himself with his father's revolver, reported by J. A. Ryan (Ky. Med. Jour., Apr., 1927), the point of entry was just below the 12th rib, slightly to the left. An apparent deep contusion in the right inguinal region was noted. At operation the anterior gastric wall was found perforated, and likewise the transverse colon. There was destruction of the gut and mesentery requiring **resection** of about 4 feet of the ileum. The bullet had left the peritoneal cavity just within the right external iliac, at about the internal ring, went through Poupart's

ligament above the femoral vessels, ranged downward and outward through the thigh, and presented under the skin just over the external condyle of the right femur. In another case, with the point of entry in the right gluteal fold, the bullet ranged upward in the abdominal cavity and produced multiple intestinal perforations. Thus, wherever the point of entry, if there are any abdominal symptoms—sometimes only a general tenseness of the abdominal wall,—an immediate **exploratory operation** is indicated. It is best to **drain** the abdomen after perforating wounds, as the amount of infection carried by the bullet and by the escape of visceral contents cannot be estimated.

Abdominal injuries should not be operated on at the patient's home, according to V. Pauchet (Med. Press and Circ., Apr. 20, 1927), as this entails greater risk than not operating at all. These cases require all the favorable conditions for operating available in hospitals, as well as special experience in abdominal surgery. When the writer used to operate on them either at his private clinic or at the patient's house, according to circumstances, the mortality was about 75 per cent.; this dropped to 50 per cent. when the patients were regularly taken to a hospital or nursing home. As a rule, **local anesthesia** suffices in a wound by a knife or sword, etc., which may not have penetrated and when there is a hernia of omentum or intestine. In other cases, **ether** should be used if the patient's blood-pressure is low, **spinal anesthesia** if the blood-pressure is sufficient. When the wound is in front, the **incision** can be made through it. If one finds on dissec-

tion, layer by layer, that the wound has not penetrated, one need only disinfect with **ether** and **suture** it. In a wound by a firearm, a median incision should be made, permitting of better exploration. When the operation has been completed, the track of the projectile is **excised** and so **sutured** as to obviate suppuration and secondary hernia.

In *thoraco-abdominal* wounds, the chest wound should first be dealt with under local anesthesia, including section of a rib so as to expose the diaphragm well, and the abdominal wound then reached through a separate incision. In wounds of the *lumbar region* Pauchet makes a horizontal incision from the sacrolumbar mass toward the midline, through which both the kidney and abdominal cavity can be explored. In wounds of the *buttocks and perineum*, one should not follow the track, but perform an umbilicopubic laparotomy. In *spleen* or *liver* injuries, drainage does more harm than good. In *intestinal* wounds, if the gut has been properly sutured and the vicinity of the suture cleansed with **ether**, one need not drain. If a wound involves the retroperitoneal, pericolic, perirectal or perivisceral connective tissue, **drainage**, not of the peritoneum, but of the muscular tissue infiltrated with blood, is indicated, as it is likely to be infected; this obviates the dangerous retroperitoneal cellulitis.

Bradley Coley (Amer. Jour. of Surg., Jan., 1927) urges exploration of any puncture or bullet wound of the abdomen, no matter how trivial. In some cases it seemed almost certain that the peritoneum had not been opened, yet on exploring extensive damage to solid or hollow viscera was found. In one case there was a bullet

wound of entrance in the thorax and no wound of exit; there were chiefly abdominal symptoms, and on laparotomy the bullet was found to have passed down and severed the colon. Some stab wounds looked shallow and superficial, yet on exploring the omentum was found just under skin and in one case the liver was punctured.

#### ABORTION.—ETIOLOGY.—

Focal infection with a tendency to fresh exacerbations is regarded by A. H. Curtis (Jour. Amer. Med. Assoc., Apr. 25, 1925) as an important cause of otherwise inexplicable spontaneous abortion. Three patients with habitual abortion had lesions offering easy portals of entry for fresh infection, and all had kidney disturbance. Abortions occur in some patients who are only moderately ill, indicating that even rather mild fresh streptococcus infection endangers the life of the fetus. Intravenous injection in numerous pregnant rabbits of fresh cultures of hemolytic streptococci obtained from the writer's 3 patients always resulted in prompt termination of pregnancy. Control experiments suggested that other virulent bacteria do not possess such a high degree of specificity. Repeated inoculation of susceptible patients with bacteria from the mouths of human carriers of infection may also be a factor in abortion.

A. C. Nickel and R. D. Mussey (Med. Jour. and Rec., Apr. 6, 1927) note that abortion due to infection is an accepted fact among veterinarians. *Bacillus abortus* is known to be responsible for much abortion in cattle and swine, while in sheep and mares the streptococcus is frequently the cause. It is also known that streptococcal cervicitis often causes abortion in cattle. The writers, pur-

suing studies as to the relation of infection to abortion in women, were able to produce abortion in guinea-pigs by intravenous injection of strains of *Streptococcus viridans* isolated from foci of infection (periapically infected teeth) in 3 patients *who had aborted*. The abortion in the animals seemed to be due to elective localization and growth of the streptococcus in the placental site, and the fetal death to invasion of its bloodstream by this streptococcus. Control strains from foci of infection in patients who had never aborted did not cause experimental abortion.

Two cases illustrating that repeated miscarriages may be due to disease in the male genital tract have been reported by M. B. Sanders (Boston Med. and Surg. Jour., Nov. 10, 1927). In both instances the wife was normal. One husband had a non-venereal vesiculoprostatis and the other, a non-venereal prostatitis. The semen of both showed excess of mucus and pus cells, with spermatozoa of poor vitality. Treatment by a course of **massage of the prostate and seminal vesicles** resulted in markedly improved vitality of the spermatozoa and a sufficiently increased fertility to cause a pregnancy to go on to term.

In general, about 1 out of every 4 pregnancies ends prematurely, according to J. Rock (Boston Med. and Surg. Jour., Oct. 28, 1926). Until the recent application of embryology to the study of abortions, the attributed causes of abortion were infinite. Kurzrok states, however, that, contrary to the popular belief, the pregnant uterus is not very responsive to external influences, including operations, train wrecks, etc. Rock endorses Streeter's conclusion that a large number of abortions must be attributed to defective germ-plasm.

He asserts that most spontaneous miscarriages are caused by intrinsic disturbances in the fertilized ovum or in the maternal organism. The older suspected causes of abortion account for but a small percentage. The causes of sterility and of miscarriage are probably in large part identical, the 2 conditions being, as taught by Macomber and Reynolds, but different degrees of diminished fertility. McCollum stresses the incidence of miscarriage or apparent sterility from subminimal consumption of vitamins or inorganic salts. Causes of miscarriage should be studied in fine detail, which includes careful examination of the products of conception as well as of both parents, who must lend themselves to a very close scrutiny regarding history, habits, diet, physical condition, etc.

Among 113 women operated upon during pregnancy at the Tarnier Clinic, according to A. Brindeau and C. Juge (Obst. et gyn., Sept., 1926), interruption of pregnancy occurred in 13. Among 45 operations for ovarian cyst there were 5 miscarriages and 1 death; among 18 operations for fibroid, 2 miscarriages and 2 deaths, and among 17 operations for appendicitis, 1 miscarriage and no deaths. **Morphine** should be given for 4 days after operations on pregnant women. Among 30 ovariectomies reported by B. von Varo (Zent. f. Gyn., July 24, 1926), there were post-operative abortions. Abortions took place only where bleeding had begun before operation and where the operation was carried out at a time when menstruation would have occurred were the woman not pregnant. The uterus is more irritable at the time when menstruation should occur. It should be handled gently during operations and the patient given **novatropine** and **papaverine** a few days after operation to reduce uterine irritability.



Abortion is not uncommon in women with *uterine fibroids*, according to R. Leibovici (*Presse méd.*, May 14, 1927), and is always a serious matter, since the fibroid tumor favors appearance of the ordinary complications of abortion, while the abortion exposes the fibroid to serious complications, and, most important of all, uterine curettage promotes hemorrhage and infection of the fibroid. Where the abortion in such cases is in its incipency, one should temporize, disinfect the vulva and vagina, and have the patient taken to a hospital. In a minority of cases, spontaneous completion of abortion will occur without complications, but more usually hemorrhage or infection will necessitate intervention. In hemorrhage **curettage** is generally possible, but is likely to increase the hemorrhage or induce infection and necrosis of the fibroid. **Supravaginal hysterectomy** is obligatory where curettage is impossible and the procedure of choice where curettage increases the bleeding. Likewise in infection or necrosis of the fibroid, a total abdominal **hysterectomy** is indicated, even if the infection is regarded as merely a simple *post-abortum* infection. **Drainage** through the vagina should be instituted. In suppurating or gangrenous fibroids the cervix should be tightly closed by suture through the vagina before the hysterectomy is carried out.

**Symptoms.**—In a series of 131 cases of abortion—accidental, criminal and missed—analyzed by Rock (*Boston Med. and Surg. Jour.*, Oct. 28, 1926), dominant symptoms were mentioned in 112 cases: Flow was complained of in 80 per cent. In 61 per cent. it was the only outstanding symptom, being associated with pain in the other 19 per cent. In 9 per cent. pain was the only complaint. In 8 per cent. rupture of the membranes without flow or pain was the chief sign. The other 3 per cent. were missed abortion, and came to

the hospital because of cessation of growth or foul discharge.

In the distinction between threatened and inevitable miscarriage, the main item is hemorrhage. When this amounts to as much as during the height of a normal period, abortion is probable. When excessive flow is combined with characteristic pain, it becomes almost a certainty; and if also the membranes have ruptured, with discharge of liquor, there is no more reason to hope.

Any one of these signs in mild degree, however, may persist for several days, up to 10, only to disappear under treatment. But flowing cannot be permitted too long. As soon as there are signs of depletion, active treatment should be instituted, for a severe hemorrhage may occur at any time.

Intermittent flow is not as dangerous as continuous flow, but the size of the uterus must be carefully watched if a bloody discharge is allowed to persist for weeks. If the normally pregnant uterus fails to enlarge, the ovum is dead and a useless and dangerous burden. The minor discharge of pink or brown blood or old clots may be tolerated indefinitely so long as there is no certain indication that growth of the ovum has ceased.

Ruptured membranes, in the absence of other signs of uterine activity, do not necessarily mean that the pregnancy is lost. During late pregnancy, fluid, sometimes as much as 6 ounces, may come away, at once, or in a dribbling leak, only to cease promptly or after several hours, even up to 24, and permit the pregnancy to continue to term.

Rock considers the following stand-

ards as those of the *inevitable* miscarriage; the event which does not meet at least one of these standards, as still in the *threatening* stage: (1) Hemorrhage enough to soak 5 napkins in 24 hours; (2) hemorrhage over a period of days too severe to permit continual recovery of the blood supply, as evidenced by blood count and hemoglobin, objective appearance, or subjective feelings; (3) characteristic rhythmic, sharp, aching pain low in the pelvis or back, not stopped by moderate doses of morphine; (4) evidence of ruptured membranes with or followed by any of the above.

Digital examination of the cervix, while highly informative, is contraindicated unless an immediate decision must be made as to the advisability of active treatment, and the other signs are not convincing. An exception to this is where ectopic pregnancy is considered a likely cause of the symptoms, when examination is obligatory.

**Threatened Abortion.**—In treating threatened miscarriage, Rock (*loc. cit.*) orders **rest in bed** until the patient is free from symptoms for at least 48 hours. If there is pain, or she is restless, upset, or irritable, enough **opiates** should be given to keep her quiet and peaceful. Food with large residues, such as milk, cereal and green vegetables, should be avoided. **Mineral oil, milk of magnesia**, stewed fruits, may be given if needed to keep the lower bowel from filling up. A low warm enema is not contraindicated. Plenty of **water** and **quiet surroundings** complete the treatment. The **ice-bag** over the lower abdomen stimulates the uterus to contract. This treatment is con-

tinued for 48 hours after cessation of threatening signs.

When signs have been absent for a week, examination of the patient may show that all the bleeding has come from a *cervical polyp*. This should be **ligated and removed**, but only with operating room facilities. The size of the uterus should be accurately noted for comparison the month following. The ovum may have remained in the uterus, when it should be removed.

**Inevitable Abortion.**—In cases which have not gone 3 months, Rock favors the use of a small moderately sharp **curet**. Many have taught that after 3 months the **finger** is best, but the internal os is not always soft enough, and the finger not often long enough, to obtain free action inside the uterus. Therefore, **ovum forceps** of various kinds are used to break up and extract the fetus and the placenta, the latter after it has been stripped off perhaps by the finger or a large dull curet; or, such a curet is used for both separation and extraction.

Up to the 12th week, and even longer in primiparæ, the cervix should first be stimulated to begin the normal process of effacement and dilation of itself. The death of the ovum causes this in the larger proportion of cases. Irritation of the cervix, usually by **bougie or bag or gauze pack**, is the other method.

In helping the uterus to get rid of the ovum, one has but to **pack the cervix** inside and out if it is not already sufficiently dilated or dilatable. A narrow strip of gauze is **tightly** packed into the cervical canal, and the outer end then packed into the vaults and in front of and behind the cervix. This is usually left in place

24 hours. Attention must be paid to the size of the uterus, that it does not grow larger from internal concealed hemorrhage. After 24 hours, either the conceptus is resting on the pack, or the cervix has softened enough to make further **dilatation** with finger or instrument easy and safe. If neither of these desired conditions has resulted, the treatment should be repeated. Forcible dilatation of the cervix is not to be indulged in except in an emergency.

Before the 12th week, the cleaning out of the uterus can be effected by careful use of a medium-sized sharp **curet**. After the 12th week, the gloved finger, covered with gauze, may start the evacuation, to be followed with a **dull curet**.

To stop slight oozing from raw surfaces, a **pack** soaked in **alcohol** or **iodine** may be left in the uterus a few minutes up to 24 hours at most, to be replaced by another if the bleeding continues. If the uterus bleeds, in the absence of hemorrhagic disease, it should not be considered empty. When the pregnancy has gone to 5 or 6 months before abortion, the placenta may be actually adherent, and should be treated as a placenta accreta by **packing**. In hemorrhage, where the patient has lost an appreciable amount of blood, it is well to temporize with **pack**, **rectal taps**, **hypodermoclysis**, or even **transfusion**, before attempting active operative emptying of the uterus.

**INCOMPLETE ABORTION.**—In this condition, E. Percival (Can. Med. Assoc. Jour., May, 1926) recommends the following procedure, in use at the Montreal General Hospital: If the cervix is open, easily admitting a finger, and there is free bleeding,

the uterus is emptied under **gas-oxygen anesthesia** by means of the **gloved finger**. The right hand is introduced into the vagina and the index finger explores the uterus and separates the piece of placenta, while the left hand, placed on the abdomen, grasps and steadies the uterus. The loosened fragments are removed, if necessary, with ovum forceps. On the other hand, if the cervix does not admit a finger, a 1 or 2-inch **gauze pack** soaked in **acriflavine** emulsion is pushed into the uterus with an appendiceal packer without anesthetic. The fundus, cervix and vagina are all tightly packed. This packing is removed 24 hours later under anesthesia, and the uterus explored with the gloved finger, to ascertain if the uterus is now free of all products of conception. No douche, vaginal or intra-uterine, is given. Forty-eight hours after returning from the operating-room, the patient is allowed out of bed and is discharged the following day. Cases thus treated required only 5.2 days of hospitalization and had an average maximum temperature of 99.2° F., as against 9.2 days and 100.6° F. in another series treated by instrumental dilatation and curettage. The procedure is also superior to the "conservative" method (pituirine and vaginal packing when necessary) in the certainty that the abortion is complete, whereas after pituitrin and vaginal packing many patients come back in a few days or weeks with either pain from spreading infection or hemorrhage due to a retained fragment.

**MISSED ABORTION.**—An unusual case reported by A. Stein (Med. Jour. and Rec., Sept. 21, 1927) is that of a woman aged 37 who, when 4

months pregnant, had a fall on the stairs which killed the fetus but did not induce abortion. Spotting of her napkins occurred for 2 weeks, then ceased. Five months later she had profuse bleeding; her physician told her she had had a miscarriage and curetted her at home without an anesthetic. There resulted a rupture of the anterior wall of the cervix, induction of labor pains, and birth of the dead fetus into the vesico-uterine space. At a second attempt at curettage at the hospital, the instrument brought down omentum. Immediate laparotomy revealed 4 puncture wounds in the small intestines and the fetus lying partly in the vesico-uterine space and partly within the torn wall of the cervix. The intestinal perforations were sutured, **supravaginal hysterectomy** performed, and the wound drained. Recovery followed. The case is held to illustrate the danger of curettage in the home without an anesthetic; the patient is sure to move around because of pain and the risk of perforating the uterus is greatly increased.

**SEPTIC ABORTION.**—The opinions of different observers continue to vary regarding the treatment of febrile abortion. G. Schwarz (Zent. f. Gyn., May 8, 1926) advocates a **conservative drainage** treatment. A narrow, dry or alcohol-saturated piece of gauze is introduced into the uterus just beyond the internal os, and changed daily for 5 or 6 days under aseptic precautions. Besides keeping the cervix patent, it excites uterine contractions, spontaneous expulsion of placental remains generally taking place after the 2d or 3d change of gauze. There is little risk of bleeding; any pronounced bleeding is

checked by introducing a wider piece of gauze. There was no mortality among 62 febrile cases thus treated. The average period of hospitalization is 15 to 20 days. The method can be employed even in cases in which digital or instrumental maneuvers seem dangerous.

The **quinine** treatment of septic abortion is recommended by R. Kessler (Zent. f. Gyn., Nov. 20, 1926). Where, in abortion, the axillary temperature exceeds 37.5° C. (99.5° F.) he institutes a conservative treatment consisting of the administration of 5 doses of quinine of 3 grains (0.2 Gm.) each by mouth at intervals of 1 or 2 hours. Prompt uterine contractions generally follow, and in most cases the fetus and placenta are expelled within 48 hours. If the uterus fails to contract, small doses of **pituitary extract** may be given. If evacuation does not occur in 2 days, the quinine treatment is repeated on the 3d day. In 14 out of 86 cases of imminent abortion, the fetus was expelled within the first 12 hours. The procedure evacuates almost as rapidly as active and instrumental treatment, and with less risk. Under quinine only 1 out of 107 cases died. The treatment also has the advantage of relieving the physician of the blame that might be placed on him if he emptied the uterus in a septic abortion and the patient died, even though the infection had been caused by an abortionist.

On the other hand, F. Clauser (Zent. f. Gyn., Feb. 6, 1926) favors active treatment on the basis of 264 febrile cases thus treated with but 2 deaths. He advocates immediate evacuation of the uterus with **instruments** in febrile abortions. The



sooner the uterus is emptied, the better the prognosis. Conservative treatment is to be applied only in acute peritonitis and general sepsis.

A procedure midway between the conservatives and the radicals is favored by J. Rock (Boston Med. and Surg. Jour., Oct. 28, 1926), who describes the prevailing practice at the Boston Lying-in Hospital. A temperature of 101° F. with a pulse of 100 before the 20th week usually indicates a dangerous infection which will tolerate nothing more drastic than a light **pack** (often ineffective) supplemented by **pituitrin** intramuscularly or **quinine hydrochloride** by mouth. If the patient is toxic and sick, the uterus should be left alone. In cases past the 20th week, the condition is more serious and the uterus should not be invaded. Hemorrhage, however, takes precedence over sepsis in treatment. If there is a fair assumption of absorption from toxic products dammed back in the uterus, assuring drainage by gentle **finger dilatation of the cervix** is justifiable. Routine speedy emptying of the uterus as soon as the diagnosis "inevitable" is made (provided the case is clean) in cases of afebrile miscarriage largely forestalls sepsis and serious hemorrhage. Where febrile patients are operated on their hospital stay is longer and their chance of running a temperature after delivery is greater than if they are allowed to deliver spontaneously.

In a study of 70 cases of puerperal sepsis and 285 of abortion sepsis in the Women's Hospital, Melbourne, E. R. White (Med. Jour. of Austral., July 9, 1927) states that in abortion sepsis and sapremia with free hemorrhage one should first try local stimulatory treatment, *viz.*, **quinine**, **ergot**

and **strychnine** by mouth and **pituitrin** hypodermically. If this be ineffective, the uterus should be gently cleaned out and emptied with the **finger**, the curet being avoided if possible. In incomplete abortion with pyrexia (generally sapremia), if the temperature is 37.4° C. (99.4° F.) or over, the uterus should be allowed to empty itself, aided by stimulatory treatment; but after the temperature has subsided for 5 days, it may be emptied artificially, preferably by the **finger**. In local sepsis, **autogenous vaccines** are useful in protracted, chronic cases. In septicemia, **mercurochrome intravenously** has given the writer valuable help. He injects a 1 per cent. solution of it at the rate of 22.7 c.c. per 45 kilos (100 lbs.) of body weight. Of 19 cases of puerperal and abortion septicemia receiving mercurochrome, 11 recovered; of the 8 fatal cases, 4 had general peritonitis.

**CRIMINAL ABORTION.**—E. A. Ficklen (New Orl. Med. and Surg. Jour., June, 1927), among 46 replies to a questionnaire from physicians interested in obstetrics, received estimates averaging 77.4 per cent. as to the percentage of abortions that is induced. Thirty-nine physicians agreed that midwives are the principal offenders, and next to them the patients. The average estimate of fatalities in criminal abortion was 12.5 per cent. With all cases included, however, the writer believes the death rate to be below 2 per cent., since many cases are not seen by physicians and only the very sick cases are suspected of interference, while the patients who make uneventful recoveries are often thought to have aborted spontaneously. Any factor that reduces the number of unwelcome pregnancies automatically reduces the number of criminal abortions. The condemnation by certain churches of therapeutic

tic abortion has had a salutary effect in preventing the evils of ill-timed interferences. An abortion performed for insufficient reason is a criminal one, and the indications for interruption are becoming steadily less numerous. The vast majority of induced abortions occur in the married. At least  $\frac{1}{3}$  are due to the patient alone; legislation is as futile in this matter as in suicidal cases. There is no record of a trial in the United States of a woman for self-induced abortion. In general, advising a woman to take a drug with intent to procure abortion may, under the provision of certain statutes, constitute a criminal offense. In treating post-abortion cases, no effort should be made to force the confidence of the patient unless the disclosure of the cause would materially modify the form of treatment.

In 2 cases of abortion with marked jaundice, a positive diagnosis of infection by *B. welchii* was made, as reported by Magarey, Cleland and Slesman (Med. Jour. of Austral., May 28, 1927). These cases, suffering from gas infection of the uterus, were rapidly fatal. The infection is of fecal origin, and is introduced by criminal abortion. The treatment consists of early use of large amounts of *bacillus welchii* antitoxin.

Saturski (Zent. f. Gyn., Jan. 8, 1927) reports the case of a woman who ingested 50 Gm. of lead monoxide, a little at a time, to procure abortion. Four days after the first dose, she entered a hospital for perineoplasty, but was found to have bilateral pyelitis, neuritis and imminent abortion. Abortion took place 23 days later, recovery following. The possibility of chemical poisoning should be remembered in cases of abortion exhibiting toxic symptoms.

**HABITUAL ABORTION.**—J. Novak (Zent. f. Gyn., Apr. 10, 1926) reports 4 cases in which the giving of **potassium iodide**, 15 grains (1 Gm.) daily, together with **iron** in the form of Bland's pills (and in 1 instance occasionally **arsenic**), continued throughout pregnancy, resulted in the birth of healthy children although 1 to 6 miscarriages had previously occurred. This treatment had been applied by others for many years and the results ascribed to the effects on syphilitic infection, but it was then discovered that habitual abortion in patients with nephritis and endometritis was likewise benefited, and that it was successful in cases with negative Wassermanns. Of the writer's 4 cases, 2 were Wassermann-negative and evidences of syphilis were absent in the others. He ascribes the good effects of the iodide to stimulation of the thyroid gland.

In a case recorded by H. Vignes (Prog. méd., Aug. 13, 1927) there had been 3 abortions, which he ascribed to a slight *thyroid insufficiency*. There was no response to antisyphilitic treatment. **Thyroid** was given previous to and during the 4th pregnancy, a normal child resulting.

Another case, reported by the same author (Bull. Soc. d'obst. et de gyn. de Paris, Jan., 1927), seemed to support the view of *focal infection* as a possible cause of habitual abortion. The woman had had 4 spontaneous abortions. The 4th pregnancy and abortion was complicated by a dental abscess, with disturbance of the kidneys and ureters. One month after her 5th conception, the writer found streptococci and other germs in the gums and vaginal discharge. An **autogenous vaccine** was prepared

from the oral and vaginal streptococci, staphylococci and pseudodiphtheria bacilli, and 12 injections of it given. Later the vaginal secretion was found to have been freed of streptococci, and the patient had a living child at term. Syphilis could not be excluded as a partial cause in this case since, although the Wassermanns of both mother and father were negative, a pediatrician examining the child found some evidences of syphilis.

E. Poulsson (Münch. med. Woch., Apr. 22, 1927) ascribes to the giving of **codliver oil** during pregnancy the normal delivery witnessed in a case of his in which there had been several spontaneous abortions.

**INDUCED ABORTION.**—Observant of a recent tendency in some quarters to laxity in regard to the indications for induction of abortion, J. S. Fairbairn (Lancet, Jan. 29, 1927) emphasizes that medical indications should alone be considered. Medical indications should be defined as those clearly involving danger to the life or health of the mother or damage to the pregnancy sufficient to interfere with its future development, and the onus of proof should rest on the practitioner concerned. In doubtful or borderline cases observation of the patient away from home and failure of other methods of treatment should have proved that abortion is the only resource. In *heart disease*, his own experience has been that if the woman does not improve by rest in bed and medical treatment neither will she improve by ending the pregnancy. As to the question whether the next pregnancy should be ended for fear of return of a *mental disorder*, he endorses the rule

that if the second pregnancy has followed soon after the one in which the trouble arose it should be terminated; also in any case in which insanity has occurred in more than one previous pregnancy.

R. H. Cole (Brit. Med. Jour., Aug. 7, 1926) finds that the commonest types of *insanity* occurring in pregnancy are manic-depressive and dementia precox. When symptoms of exhaustion ensue in the first months of pregnancy from the severity of a mental disorder, it is doubtful whether termination of pregnancy would be beneficial; it might make matters worse. Refusal of food, insomnia, and suicidal tendencies require most careful observation of the patient, but the pregnancy should be allowed to continue. The obsession of a wife that a child born to an insane husband may be mentally defective affords adequate grounds for intervention. A. L. McIlroy (*ibid.*), however, discussing in general the indications for induced abortion previous to viability of the child, states that the obstetrician should not be influenced by any likelihood of defect in the character of the offspring. If completion of the gestation is undesirable for medical reasons, the patient should be urged to avoid subsequent pregnancies. If this course is impossible, sterilization is to be considered.

As regards therapeutic abortion in cases of *tuberculosis*, E. Sergent (Presse méd., Nov. 27, 1926) states that out of 89 cases of tuberculosis of slow onset and progression, no less than 23 had gone through childbirth within the preceding 10 months. No other etiologic factor of tuberculosis occurs so frequently as this in women below 40 years of age. There also

occur cases of abrupt, grave *post-partum* tuberculosis, which have led him to institute prophylactically a small bilateral pneumothorax within a few hours after delivery, in order to keep the lungs at the same degree of compression previously maintained by the pregnant uterus forcing the diaphragm up in the chest. Pregnancy is unquestionably a factor in lighting up apparently arrested or latent tuberculosis. Women with a history of tuberculous disease must be watched with extreme care during the period after marriage and during pregnancy and the post-partum period.

In inducing abortion, McIlroy (*loc. cit.*) prefers the slow method, especially in cases of severe wasting disease such as phthisis. Abortion can be induced without sepsis by **tents**. Cervix dilatation with **Hegar's dilators** and introduction of a **gauze and glycerin drain** induces evacuation with little or no hemorrhage. Where the uterus proves sluggish, a small **rubber tube** or **large catheter** inserted into it acts well. Where the fetus is palpable, induction by the rubber tube or by **rupturing the membranes** and **pulling down the leg** is feasible. The rapid method of evacuation under anesthesia is inadvisable except in very early pregnancy. J. B. Barris (*ibid.*) finds the rapid method applicable up to the end of the 3d month; not much cervical dilatation is needed, and the finger is able to explore the uterine walls completely and loosen the ovum. After the 3d month he prefers a small **hydrostatic bag** after cervix dilatation by a laminaria tent or metal dilators. In the rare cases requiring evacuation after the 3d month, he favors a **vaginal hysterotomy** with division of

the anterior lip of the cervix and removal of the fetus by grasping a leg. In vesicular mole, evacuation by abdominal **Cesarean section** has given good results.

Therapeutic abortion by the **X-ray** was successfully applied in 22 cases by D. D. Wyser and M. D. Mayer (*Amer. Jour. of Obst. and Gyn.*, July, 1927). In each instance there was an absolute indication for abortion, and in practically all sterilization was the contraceptive of choice or necessity. From 1 to 4 X-ray treatments in a hospital were given, spontaneous abortion following. Occasionally a twist with forceps was required to deliver the loose, protruding ovum. Discomfort was relatively slight and the average bleeding rather less than in miscarriages from other causes.

**Anterior abdominal hysterotomy** for interruption of pregnancy and **sterilization** is advocated by P. Oginz (*Surg., Gyn. and Obst.*, Apr., 1926) for certain cases. Through a midline incision, which may be as short as 2 inches (5 cm.) in the early months of pregnancy, the uterus is brought out of the abdomen and incised anteriorly. Its contents is detached and removed with the gauze-wrapped finger or a sponge-stick forceps. 1 c.c. (16 minims) of **pituitrin** injected into the uterine muscle, the uterus closed by 2 layers of plain catgut, each Fallopian tube knuckled, the limbs of the knuckles tied off with silk, the apex of each knuckle cut off and the raw surfaces cauterized. None of the cases subjected to this operation in 4 years showed any post-operative morbidity. The procedure is to be carried out only after consultation of an internist and gynecologist, and is indicated mainly: (1) In pulmonary tuberculosis running a subacute course and with a history of one or more previous therapeutic abortions. (2) In aortic regurgitation, especially when complicated with a relative mitral regurgitation or with a history of previous decompensation; also in mitral lesions with repeated decompensation, espe-



cially mitral stenosis, in auricular fibrillation, and in myocardial degeneration due to chronic infection. (3) In glomerular nephritis little affected by treatment, and if hypertension is present; in nephrosis, when pregnancies have caused acute exacerbations, and in the chronic hypertension of nephritis.

**ABSCESS.—ACUTE.**—Early aspiration in the various deeper suppurative processes for both diagnostic and therapeutic purposes is advocated by G. W. Haigh (Boston Med. and Surg. Jour., Jan. 27, 1927). After persistence of localized inflammation for 3 to 6 days, the needle and syringe should promptly be used. In *alveolar abscess*, in which the marked tumor and induration conceal the gathering of pus for several days, aspiration reveals the pus often 7 to 10 days before fluctuation appears. Injection of **procaine** solution during the exploration will permit of free **incision** and **drainage**, if indicated, without resort to a general anesthetic.

In *breast abscess* the indication for aspiration is the continuation of a painful, tender swelling, discrete and rather deeply seated, for more than 3 to 5 days. The exact site of a purulent exudate can thus be ascertained soon enough to cure the patient with a simple operation under a local anesthetic.

In *cellulitis*, since the exudate, especially at first, is usually more serous than purulent, the aspirated fluid may require microscopic examination of a stained smear. Several attempts at aspiration in the superficial or deep fascial planes may be necessary to clinch the need for operation. Obviating the usual delay of 3 to 7 and even 10 days permits of treatment by a

simple minor operation, instead of a major one with many slashes and slow drainage.

In *perinephric abscess*, aspiration is the only means of early diagnosis. Repeated exploratory punctures can be harmlessly carried out at a point 2 to 3 centimeters ( $\frac{4}{5}$  to  $1\frac{1}{5}$  inch) from the free end of the 12th rib, internal to its tip and at the same level as the tip, straight through the latissimus dorsi and the outer edge of the quadratus lumborum. The needle passes in 5 to  $7\frac{1}{2}$  centimeters (2 to 3 inches) and is moved from side to side; entrance of its point into the abscess is easily detected by the lessened resistance. Suction, tried several times if necessary, will reveal the pus early enough to allow an early cure without complications.

Läwe's method of **blood injections** about inflammatory foci is praised by O. Wiedhopf (Zent. f. Chir., Nov. 5, 1927). The procedure proved effective, among others, in infections of the *face* and *axilla*. It is especially valuable in severe, quickly progressive *furuncle of the upper lip*. The patient's own venous blood is injected around the focus. It slows absorption of toxins and checks inflammatory extension. Leukocytes from the injected blood and also the bactericidal activity of its serum are believed to take part in producing the beneficial results.

Abscesses sometimes met with beneath the calluses at the bases of the fingers in men who work with shovels are referred to by H. H. Le Seur (Amer. Jour. of Surg., Jan., 1927). The symptoms may seem out of proportion to the appearance of the blister, yet there may be an abscess under the deep fascia, which may spread to the tendon sheath, lumbrical muscle, vessels and bone. For successful treatment one must remember all the possibilities, and not be satisfied with merely taking the top off the blister.

**ISCHIORECTAL.**—A case of *psychosis* due to a latent ischio-rectal abscess is reported by G. Zilboorg (N. Y. State Jour. of Med., July 1, 1927). Two months before admission to an institution the man had begun to show forgetfulness and confusion and run a persistent temperature. He complained of constipation and pain in the region of the hips, and became delirious, restless, and hard to manage, yet on admission rectal examination was negative. He lost orientation as to time, place and person, and showed impairment of both remote and recent memory. Sixteen days after admission his buttocks appeared mottled and bluish; deep induration and slight redness developed on the right buttock 5 centimeters (2 inches) from the anus. The patient was operated for ischio-rectal abscess and some 100 to 150 c.c. of sanguinopurulent material, which yielded streptococci, evacuated. The mental symptoms gradually disappeared.

Haigh (*loc. cit.*) alludes to the frequent tardiness in the recognition of ischio-rectal abscess, because of its depth, late fluctuation, and the sensitiveness of the anal region. To detect early a swelling on the more tender side beneath the rectal wall just above the sphincter, infiltration of the perianal tissues with **procaine** solution suffices. If there is doubt about the stage of the inflammatory reaction, it is safe to aspirate, with or without a finger in the rectum as a guide, by introducing the needle into the perianal tissues toward the swelling found to encroach upon the rectum. Such an aspiration, at first intended merely for diagnosis, may, in addition, quickly cure the patient.

**PERINEPHRIC.**—Cough in the recumbent posture, with purulent expectoration, is deemed by H. T. von Deesten (Jour. Amer. Med. Assoc., Jan. 8, 1927) a diagnostic symptom of a ruptured perinephric or other subphrenic abscess when pulmonary disease is not demonstrable. In the case he reports, this symptom developed 10 weeks after the onset of pain in the chest, hip, and in other joints. The symptoms suggested a periodic emptying of pus into a bronchus. Tenderness over the left lower ribs and lumbar region, together with a slight lumbar fulness, suggested perirenal involvement. This was confirmed by operation, **drainage** of the abscess giving prompt relief from the cough and expectoration.

**PERIURETHRAL.**—Early incision per urethram is the best method of abruptly terminating *penile periurethral abscess*, according to H. Bailey (Lancet, May 29, 1926). Gas anesthesia suffices. The help of an aëro-urethroscope is desirable, but if the abscess is near the meatus, as it usually is, it may be dealt with by inserting a tenotome down the urethra. *Bulbar periurethral abscess* usually occurs behind a stricture of the bulbous urethra, and is much more serious, being the commonest cause of extravasation of urine. Under general anesthesia a midline perineal incision is made. Pus is reached at what appears a considerable depth, and is frequently small in amount. The after-treatment consists of daily **irrigations** of the wound with **eusol** through a Higginson's syringe, and **sitz baths** for at least  $\frac{1}{2}$  hour twice daily. When inflammation has abated and the wound looks clean—usually in about 10 days,—the renal function

is tested, and if satisfactory, the urethral stricture receives attention, sometimes by **dilatation with bougies** but more often by **internal urethrotomy**. A catheter is now tied in, and changed every 4th day until the perineum is healed. Throughout the after-treatment a mixture containing **sodium biphosphate**, 30 grains (2 Gm.), is given 3 times daily with **methenamine**, 10 grains (0.6 Gm.). The patient should be warned that the stricture requires regular dilatation. In treating periurethral abscess *with extravasation*, after passing a **bougie** into the bladder by the "fag-got" method, **incising** the abscess and the floor of the urethra, **passing the finger into the bladder**, and stitching in a coudé catheter, Bailey passes the finger to the sides of the symphysis pubis, incises the skin over it, inserts **drainage tubes**, then makes a few deep **incisions** into the infiltrated tissues, and injects **hydrogen peroxide** hither and thither into them through an aspirating needle.

**RETROPHARYNGEAL.**—According to E. I. Lloyd (Lancet, Feb. 12, 1927), the **incision** in retropharyngeal abscess must extend down the pharynx to the limit of the cavity. This downward extension is best accomplished by the finger. Finally, a thorough inspection is made of the cavity, which is cleaned with ribbon gauze and left open. For local use after the operation,  $\frac{1}{2}$  per cent. **chloramine** as a throat spray is satisfactory, and a mixture containing **ammonium carbonate** and **ipecacuanha** may be given for bronchitis. Refilling of the abscess is nearly always because of inadequate incision, and must be corrected at once. Some patients after operation have a diurnal

fever, up to 104° F., for a long time, yet completely recover. As soon as the acute illness has subsided, the tonsils must be dissected and the adenoids removed. A slow convalescence can sometimes be surprisingly hastened by a timely removal of the primary focus.

J. B. McMurray (Atlantic Med. Jour., Nov., 1926) advocates the use of a **suction tip** to remove the pus as it drains from the abscess cavity after incision. Among 18 cases seen by him, 4 deaths occurred—1 from septicemia in a neglected case, 1 on the operating table while attempting an external drainage in a very extensive lateral extension, 1 from hemorrhage through erosion of the internal carotid and the 4th from collapse immediately after drainage. Every case of recurrent hemorrhage after drainage, especially where spontaneous rupture has occurred, demands careful observation. **Ligation of the internal carotid** will alone save life after erosion of the vessel. There were also 2 cases of non-fatal collapse after drainage, 1 being kept alive for 2 days by keeping it on its left side and artificial respiration at intervals, recovery following. The writer ascribes collapse in these cases to the sudden release of pressure upon the vagus upon incision, and deprecates unnecessary trauma in drainage.

**SUBPHRENIC.**—In 32 cases studied by A. O. Whipple (Amer. Jour. of Surg., Jan., 1926), the original foci of infection were: Biliary tract, 8; stomach, 4; duodenum, 3; appendix, 5; pelvic lesions, 3; hepatic abscess, intestinal perforation, empyema, and kidney lesions, 2 each; pneumococcus peritonitis, 1. The exciting organisms found were: Colon bacillus, 13; streptococcus, 9; staphylococcus, 5; Welch bacillus, 4; pneumococcus, 2; *B. pyocyaneus*, 2; tubercle bacillus, 1; undetermined, 7. The ab-

cess, in addition to pus, may contain blood, bile, food remains, and other foreign bodies. One-third to  $\frac{1}{2}$  the cases show gas, usually caused by the colon bacillus and anaërobes from the gastrointestinal tract. Eleven of the writer's cases had an abrupt onset, with symptoms of "acute abdomen"; 13 developed insidiously, and 8 followed an operative procedure involving the subphrenic space. Subphrenic abscess should be suspected in every abdominal operation where there are unexplained septic temperature, sweats and loss of weight and strength. Roentgenography gives the most important findings. The exploratory needle should not be used.

Of great value in preventing a subphrenic abscess, *c.g.*, in upper abdominal drainage in cholecystectomy or choledochostomy, is the turning the patient over on the face 2 or 3 times a day after the 1st week of the operation. This drains the puddle of fluid tending to collect in the subhepatic space. Another precaution is to leave drainage in long enough for a tract to be established. Early **incision** and **drainage** of subphrenic abscess is wise once the diagnosis of abscess is established, but early needling and too early exploring of the subdiaphragmatic area may do considerable harm. Daily X-ray and physical examination with notes for comparison will usually determine in 3 or 4 days whether an abscess is really present. As a rule the 10th rib in the midaxillary line is the best approach. Paravertebral **novocaine** injection, going 2 rib spaces above and below the 10th rib, gives the best anesthesia. Either **intercostal incision** or **rib resection** will give good exposure and drainage if the incision

is long enough. The newer, electrically lighted retractors are of great help in inspecting the abscess.

Two large soft rubber tubes, arranged to be connected to **bottle drainage** for irrigation, afford the best **drainage**. The wound edges do well with **dichloramine** or **iodoform gauze packing**. Little or no suturing is necessary. Within 1 or 2 days the writer begins **dakinization** if the abscess wall is well formed and has no peritoneal communications.

F. W. O'Brien (Boston Med. and Surg. Jour., Mar. 31, 1927) quotes Lockwood, who reviewed over 3000 cases, to the effect that between 85 and 100 per cent. of all unoperated cases die, that 23 to 40 per cent. of operated cases have died, and that the mortality with prompt treatment should be reduced to 16 per cent. The writer emphasizes the importance of X-ray diagnosis for early diagnosis and treatment. In a simple right-sided subdiaphragmatic abscess, pictures taken with the breath held at full inspiration show the diaphragm on the affected side much elevated as compared to the left, with the dome smooth and regular and the tissues above clear. Fluoroscopy shows immobility of the diaphragm on the affected side. In left-sided abscess, the diaphragm on the left may equal the level of the normal diaphragm on the right or be higher. On this side the stomach is of diagnostic help, as its air-bubble may be obliterated or transposed far to the left; its position may be definitely determined by filling the stomach with air or contrast-medium. In the gas-containing type of abscess, the film shows beneath the elevated diaphragm a semicircular area of darkness, the horizontal axis



of which defines the fluid level. That fluid is present is shown by change of posture. Pleurisy with effusion, when present as a complication, is usually seen in the gas-abscess type.

In a case reported by Bérard and Dunet (Lyon chir., xxiii, 651, 1926), **drainage** through the diaphragm was followed by injection of 50 c.c. of lipiodol mixed with 30 c.c. of sterile oil through a soft rubber catheter between the spleen and diaphragm. X-ray study thereupon revealed a highly tortuous cavity with numerous processes extending as far as the mid-line. Such an X-ray study is useful in this type of abscess cavity, which is difficult to drain, in that it shows just where the opening and counter-openings should be made.

F. Christopher (Ill. Med. Jour., Apr., 1927) calls attention to the observation made by Capps and Coleman a few years ago, that stimulation of the central portion of the diaphragm produces pain sharply limited to a point somewhere along the trapezius ridge in the neck. *Pain in the neck* is highly suggestive of the upward pressure on the diaphragm caused by a subphrenic abscess. An abscess at the periphery of the diaphragm would, instead, cause costal pain.

**Closed drainage** in subphrenic abscess is advocated by J. D. McEachern (Surg., Gyn. and Obst., Aug., 1926), who reports 2 cases. The method was suggested by the successes previously obtained from it in the treatment of empyema, to which subphrenic abscess is in many respects allied. Drainage is established with a minimum of shock to the patient. Under local anesthesia a small **rubber tube** with a terminal and a lateral eye is inserted into the abscess cavity through a **trocar**, if necessary without removing the patient from his bed. Absorbent cotton saturated with collodion is now laid in succes-

sive layers against the skin around the tube, building up a collar  $\frac{3}{4}$  inch thick and 5 inches in circumference. This seals the opening around the tube for 10 to 30 days and holds the tube fixed. A glass connection of the Y type is then attached to the tube, one end of the Y connected with a siphon suction apparatus, and the other to a container at a higher level holding **Dakin's solution**. The cavity is **irrigated** with this solution every 2 to 4 hours in the daytime and 2 to 4 times at night. The Dakin's solution softens the rigid walls of the cavity and overcomes infection. With negative pressure, the collapsed lung expands, the diaphragm returns to its normal level and the abscess is obliterated. The method is especially useful in the desperate cases weak and emaciated from weeks and months of sepsis, and in which the mortality from open operation is very high.

**TUBERCULOUS.**—Among 110 cold abscesses recorded by R. Pollok (Lancet, Jan. 29, 1927), the relative frequency was: Psoas, 28; gluteal (6 from spine, 6 from hip), 12; knee, 11; lumbar (7 from spine, 2 from sacroiliac joint), 9; hip, 10; forearm, 6; dorsum of hand, 5; leg, 5; ribs, 5; thigh, 4; sternum, 4; elbow, 3; ankle, 2; retropharyngeal, 2; upper arm, 2; scalp, 1; foot, 1. As routine treatment for cold abscesses, he strongly advocates **aspiration** (with the puncture made obliquely and with the skin drawn aside) followed by injection of **Calot's modifying fluid**. This consists of **olive oil**, 70; **ether**, 30; **creosote**, 5; **guaiacol**, 1, and **iodoform**, 10 parts. The best olive oil is shaken up with 1 per cent. of absolute alcohol, and the mixture left in a filter funnel for 12 hours; the alcohol floats

to the surface, carrying impurities with it. The oil is then sterilized by boiling for 15 minutes. The creosote, guaiacol and iodoform are triturated in a sterilized mortar with sterile pestle, and added to the oil when it has cooled below 60° C. The ether is added when the mixture is cold. The resulting fluid is kept in the dark in a sterile Erlenmeyer flask, capped with rubber. It is not advisable to give more than 10 c.c. (2½ fluidrams) as a dose, once weekly; this can be repeated indefinitely as long as the abscess requires aspirating. Smaller doses are given to children, according to age.

Out of 97 cold abscesses thus treated only 26 broke down with sinus formation, whereas of 18 abscesses treated by aspiration only, 12 broke down, the remainder healing. The injections were also found of distinct use in *white swellings* of joints.

**Hot water injections** (60° C.—140° F.) are recommended by H. L. Rocher (*Presse méd.*, Mar. 19, 1927) in glandular cold abscesses, athriferent and ossiferent abscesses, and especially the abscesses attending Pott's disease and coxalgia. Extensive pus collections in the iliac fossa were dried up by a few such injections. Where skin ulceration was imminent, these injections seemed to harden the tissues and prevent sinus formation. In dealing with an abscess, after all the pus has been withdrawn through a sufficiently large needle introduced at the side of the collection, hot water or **Hayem's solution** is injected with a syringe and the cavity washed out continuously for 3 to 5 minutes, the temperature of the fluid being maintained at 60° C. If the fluid withdrawn becomes not only pink, but

bright red the lavage should be stopped. If, after complete evacuation, the opening is of such size as to suggest later sinus formation, a small Michel's clamp should be used to keep it closed for 48 hours. A somewhat tight cotton dressing is applied. The moderate burning pain caused by the injection is readily born by adults or adolescents, and passes off after the needle is withdrawn. No inflammatory reaction follows. Sometimes one lavage results in cure of the abscess, but usually the treatment must be repeated a few times.

According to J. T. Rugh (*Atlantic Med. Jour.*, June, 1927), there are only 3 indications for interfering with a cold abscess: (1) When it is increasing rapidly in size; (2) when it is pointing and threatening to break; (3) when it is interfering with the patient's health. **Aspiration** is alone indicated. As a rule, if proper treatment of the original tuberculous lesion is instituted early and followed out thoroughly, the abscess will disappear. In a paralyzed boy with a tremendous kyphosis and an abscess filling the entire right side of the abdomen, a plaster-of-Paris cast was applied in firm extension and the patient kept in bed all summer. The abscess gradually disappeared, and no evidence that it had ever been present remained. The paralysis passed off, and the boy was fitted with a brace, enabling him to walk.

#### ACANTHOSIS NIGRICANS.

—As noted by L. M. Wieder (*Jour. Amer. Med. Assoc.*, Dec. 11, 1926), 95 authentic cases of this disease have been collected. One type, forming the larger group, has shown a striking association with malignant dis-

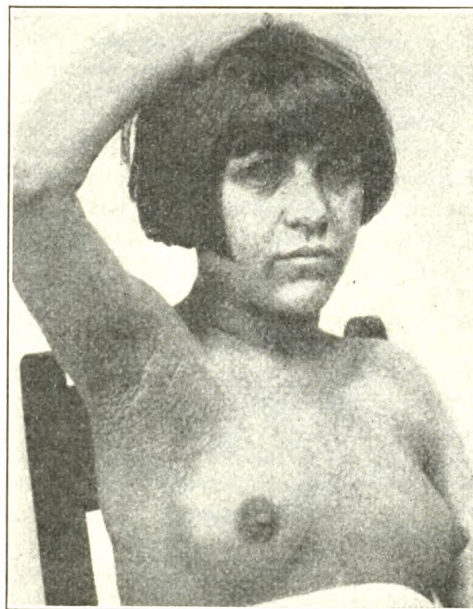


ease, chiefly of the abdominal viscera. In the smaller group, there is neither evidence of malignant change nor marked impairment of general health. The latter ("juvenile") type is usually found in the first 2 decades of life. The writer adds a new "juvenile" case to the 11 previously known. The patient was a schoolgirl aged 10 years [see cut]. In the course of 18 months the whole skin surface had developed a definite hyperpigmentation, most marked in the neck, axillæ, abdomen, genitocrural regions and popliteal spaces. The pigmentation ranged from that of the average brunette skin to a dark chocolate brown (negroid). The most deeply pigmented areas showed an associated papillary hypertrophy, giving the skin a rough appearance, though it retained a velvety consistency. The face presented numerous pinpoint to lentil-sized discrete and confluent highly pigmented macules. Physical examination for abdominal or other abnormalities was negative, but there were noted hypoacidity of the gastric content, increased sugar tolerance, prolonged reaction to epinephrin (Goetsch test), low metabolic (—6) and pulse rates, and disturbed ovarian function (cessation of menses at 13 years).

While many cases of this disease are directly due to tumors causing pressure on the abdominal sympathetic system and suprarenal glands, the juvenile cases are not thus accounted for. In such instances the pigmentation may be explained by hypofunction of the suprarenals, of which striking evidences were demonstrated in the author's case. As for treatment, White's and Roblee's cases improved under **thyroid**. In the writer's

case thyroid and pituitary extract had no appreciable effect. Some have recommended **X-ray** therapy, but in this case 1 erythema dose increased the pigmentation. Rubbing small patches with 5 per cent. **sodium hydroxide** solution daily produced some temporary diminution of pigmentation.

A tumor having been found in only 45 per cent. of the cases, according to



Distribution of pigment and associated thickening in a case of acanthosis nigricans. (Wieder, in *Jour. Amer. Med. Assoc.*)

Küttner (Mitt. a. d. Grenz. d. Med. u. Chir., xxxix, 276, 1926), acanthosis nigricans is not an absolute indication for **exploratory laparotomy**, which should, however, be seriously considered in all cases except those in young patients with familial obesity, diabetes or developmental disturbances, in which event the disorder may be regarded as idiopathic.

J. Brito Foresti and B. Vignale (Rev. med. del Uruguay, Mar., 1925) have reported a case of acanthosis nigricans in a man of 48 years; he

died after a gastroenterostomy and secondary jejunostomy for cancer of the bowel.

**ACETANILIDE.**—All of the aniline derivatives are quoted in the literature as producing methemoglobin. According to A. G. Young and J. A. Wilson (Jour. of Pharm. and Exp. Ther., Mar., 1926), however, a review of the cases reported showed that in practically every instance there is reason for doubting this conclusion. The spectroscope is hardly adequate to determine methemoglobin in clinical cases, and in the reported cases the delicate colorimetric methods more recently discovered were not used. From spectroscopic and colorimetric tests in acute and chronic acetanilide poisoning in dogs and rabbits the writers conclude that acetanilide does not produce methemoglobin. The action of acetanilide upon the heart, blood and circulation is essentially the same as that of aniline. Acetanilide, like aniline, forms para-aminophenol in the blood plasma and urine. This may account in part for the cyanosis observed in acetanilide poisoning. Prolonged administration of sublethal doses of acetanilide produces anemia and emaciation. The fall in the red cell count, hemoglobin and oxygen capacity is parallel. The first toxic action upon the heart appears to be a change in the conduction mechanism. The type of change and amount depend upon the rate of injection as well as the amount of drug given.

Acetanilide in aqueous solution in amounts sufficient to produce the cardiac changes does not influence the respiration appreciably.

Acetanilide in 0.1 to 0.2 per cent. solution in buffered Locke-Ringer's solution, perfused through the frog's heart, always produced, according to G. B. Roth (Jour. of Pharm. and Exp. Ther., Feb., 1927), a decrease in cardiac activity as shown by a decrease in systole, diastole and rate. The use of caffeine in mixture with acetanilide did not seem of value as an antagonist to this cardiac depression, heart stoppage occurring, on an average, earlier with the mixture than with the acetanilide alone.

### ACETONE.—ACETONEMIA.—

Investigating the mode of formation of acetone bodies in the system, D. M. Ervin (Jour. of Lab. and Clin. Med., Aug., 1927) has endeavored to work out an explanation of their production which is free of the necessity of the oxidation of glucose or its derivatives and which refutes the expression, "fats burn only in the fire of carbohydrates." His explanation is based upon the theory that work is done in the system by oxidation of fatty acids and glucose. Experiments *in vitro* indicated that when oxygen concentration is kept constant but the concentration of fatty acid so increased that the latter cannot be completely oxidized there is an increase of the intermediate derivatives of oxidation, *i.e.*, acetone bodies result. His explanation, setting aside the theory of the oxidation of glucose, is held applicable to all pathologic states where the quantity of fatty acid to be oxidized rises above a given ratio of oxygen per mol of fatty acid.

As regards the physiological effects of acetone, Morris and Graham (Arch. of Dis. in Childh., Aug., 1927) believe that it has a double action, *viz.* (1) a toxic effect similar to that of methyl alcohol; (2) an acid effect on the acid-base equilibrium.

*Cyclic vomiting* with acetonemia is discussed by M. Labbé (Ann. de méd., Jan., 1927) on the occasion of a case of marked acidosis with uncontrollable vomiting observed during a mild attack of appendicitis in a young girl. Acetone bodies, organic acids, ammonia, and amino-acids appeared in large amounts in the urine. The patient was found to have had attacks of cyclic vomiting in childhood, each



time with acidosis. The acidosis is ascribed by the writer to disturbances of fat metabolism due to hepatic lesions. Death occurs, not from the acidosis, but from hepatic failure. Cyclic vomiting must be differentiated from appendicitis and from meningitis. Meningitis may be attended with acidosis, while in cyclic vomiting there may be meningeal reactions. In the treatment, insulin is of little service. **Alkalies** yield improvement but are not curative.

J. A. Killian (Jour. of Lab. and Clin. Med., Sept., 1926) has published a study having for its purpose to determine the immediate action of *insulin* upon the production and excretion of ketone bodies in diabetes mellitus. Enough insulin was given to reduce the blood sugar to about 0.150 per cent. The decrease of ketone bodies in the blood and urine was found to reach its maximum in 4 to 6 hours. A corresponding rise in the alkali reserve of the blood plasma was noted, and the writer deems this rise dependent upon the inhibition of ketogenesis. The rise in the carbon-dioxide capacity of the plasma was associated with a proportionate increase in the plasma alkalinity. The antiketogenic influence of insulin is apparently due to the more complete oxidation of carbohydrates stimulated by it.

**ACETONURIA.**—This condition is common in *acute mental disorders*. Thomas found, however, that in the majority of cases of mental disorders there is no acidosis. Cammidge pointed out that acetone bodies may occur in the urine independently of any acidosis. C. E. Palmer (Practitioner, Aug., 1926) noted that, of the new admissions to the Bethlem

Royal Hospital, 6 per cent. showed a pathologic amount of acetone. He divides these cases into 3 groups: Group I were mostly spoon-fed or tube-fed patients; the acetonuria was due to insufficient carbohydrate in the diet, and was dispelled by addition of 3 ounces (90 Gm.) of **cane sugar** daily. Group II were patients taking a normal diet, but showing signs of marked digestive disturbance. The acetonuria was variable, and the effect on it of increased carbohydrate intake likewise variable. Group III took a normal diet and had no digestive disturbance. There appeared to be a disturbance of the ketogenic balance, which might be only temporary. In many resistive cases giving alkali (**sodium bicarbonate**) was followed by a temporary diminution of resistiveness. Of the cases investigated, 47 per cent. belonged to the *manic-depressive* group. On the whole, acetonuria in acute mental disorders seemed of secondary importance. It is not responsible for any mental symptom, with the possible exception of resistiveness.

According to W. Levy (Deut. med. Woch., May 27, 1927), fright and shock have more to do with *post-operative acetonuria* than the anesthesia. He observed acetonuria in excited patients even before operation. In one instance, acetonuria developed after concussion of the brain.

The influence of *injection of adrenalin* in acetonuria in various diseased states has been studied by S. Hirschhorn and L. Pollak (Zeit. f. klin. Med., Mar. 30, 1927). Whether acetonuria was spontaneous, as in pregnancy, infectious diseases or asthma, or artificially induced by a carbohydrate-free diet, injection of adrenalin increased it. Administration of carbohydrates exerted a preventive action against this effect of adrenalin. In diabetes,

adrenalin induced acidosis in a varying degree in different cases.

The *nitroprusside reaction* has usually been spoken of by clinicians as a test for acetone, and the *ferric chloride reaction*, for diacetic acid. K. E. Appel and D. A. Cooper (Amer. Jour. Med. Sci., Feb., 1927), however, state that this is incorrect, Mathews and Folin having pointed out that the nitroprusside test is much more sensitive for diacetic acid (1:30,000) than the ferric chloride test (1:7000). The point of these 2 tests lies mainly, therefore, in the significance of the *amount* of diacetic acid in the urine as an indication of acid intoxication. Folin states that the acetone tests used by clinicians are really tests for diacetic acid.

The writers report 5 cases of diabetic acidosis with a negative ferric chloride reaction in the urine. In each there was a definite clinical picture of acidosis and a low plasma carbon-dioxide content. Allen and Wishart, from experiments in animals, have concluded that there is no parallelism between ketonuria, ketonemia, and plasma bicarbonate content, and that death may ensue with either high or low plasma bicarbonate and either high or low blood ketones. Diabetic coma and acidosis are apparently not always directly due to an abnormal accumulation of ketone bodies in the blood. Some have concluded that an unknown acid other than one of the ketone group is responsible for the acidosis in such cases. Others have ascribed absence of acetoneuria to impairment of kidney function. The writers believe the latter explanation to have been at least partly operative in their 5 cases. In 1 case, *e.g.*, the ferric chloride test

in catheterized urine was negative in spite of blood ketones at 194 mgm. per 100 c.c. In 1 instance there was severe chronic nephritis, and in the other 4, definite evidence of temporarily impaired renal function. Such temporary impairment may be due to dehydration, associated with elevation of the renal threshold for ketone bodies and other acid products of excretion (*dehydration acidosis*).

**ACETPHENETIDIN.**—A case of severe chronic poisoning by this drug is recorded by W. D. Reid (Jour. Amer. Med. Assoc., Sept. 25, 1926). A woman aged 28 entered a hospital because of blueness of the lips and finger-tips, progressive weakness and shortness of breath, and frequent "fainting." The symptoms had begun 6 weeks before. The patient had used the drug in large amounts for about 5 months on account of headache said to be due to nasal sinus infection. She was pale and breathing rapidly (70 to 80 per minute). The voice was faint. The heart sounds were soft, and the blood-pressure, S. 110, D. 65. The percussion outline of the heart was within normal limits. Electrocardiograms when the condition was most severe and in convalescence were not significantly abnormal. The blood was of a deep chocolate color; hemoglobin, 58; red cells, 2,740,000; moderate anisocytosis; white cells, 7350. The rapid breathing was "nervous," falling to normal when the patient was asleep or unaware of being observed. There was no definite loss of weight. Steady improvement followed discontinuance of the drug. The absence of impairment of heart-muscle conduction in this severe case of acetphenetidin poisoning is at variance with the report of Young and Wilson on the toxic effect of acetanilide [*q.v.*, this volume], although acetphenetidin might readily be assumed to act like acetanilide on the conduction mechanism.

**ACETYLARSAN.**—This is an arsenical antisyphilitic drug of French origin, asserted to be the oxy-acetylaminophenylarsinate of diethylamine. It is sup-

plied in 3-c.c. ampoules of a 23.6 per cent. solution of the drug for use in adults and in 2-c.c. ampoules of a 9.4 per cent. solution for use in infants. The injections are made subcutaneously or intramuscularly, and are claimed to be painless and seldom productive of constitutional reactions. Injections are given weekly or twice weekly up to a total of 2.5 Gm. of arsenic in adults (1 c.c. of the solution for adults corresponding to 0.05 Gm. of arsenic, and 1 c.c. of the solution for infants, to 0.02 Gm.). The drug is asserted to cause disappearance of spirochetes from the chancre in 24 hours, healing of the initial lesion in 12 days, disappearance of secondary manifestations in 3 days, and frequently, a negative Wassermann after the first course of injections. Elimination is stated to be rapid, and the drug especially useful in **syphilitics** intolerant of the arsphenamins or harboring cardiac or aortic lesions. The drug has so far been used mainly in France and discussed in the French medical literature. Aside from syphilis, Van den Branden (Bull. Soc. de path. exot., Mar. 9, 1927) has used it in **trypanosomiasis**, and C. Audry (Bull. Soc. franç. de derm. et syph., Jan., 1927) considers it a specific in **lichen planus**.

**ACETYLENE.**—Acetylene is being used as an anesthetic mainly in Germany, where it has met with considerable success under the appellation *narcylene*, and seems to occupy a place somewhat analogous to that of ethylene in this country. As described by T. Brandt (Anesth. and Analg., Dec., 1926), of Bergen, Norway, the purified gas as used clinically has only a faint smoky odor and slightly sour taste. After preliminary administration of a little oxygen, a mixture of 70 per cent. acetylene and 30 per cent. oxygen is given for the induction. Consciousness is lost nearly always in 1, or at most 2, minutes. In a few cases there is slight excitement. Operation can be begun in 1 or 2 minutes, unless perfect relaxation is desired, in which event it is well to wait 5 minutes. The acetylene is then reduced 5 per cent. every 5 minutes to find the concentration that gives most relaxation and deepest narcosis. Recovery on removal of the mask occurs almost at once if a low percentage of the gas has been used. Under the anesthesia the face

is slightly flushed. Cyanosis is rare. Overdose is an impossibility, the gas even in highest concentrations being incapable of paralyzing the respiratory center. The blood-pressure rises considerably, sometimes even by 20 to 50 mm. Hg. and hypertension is the only contraindication. No death from acetylene anesthesia has so far been reported. For laparotomy, satisfactory relaxation can be insured by giving a **scopolamine-morphine** injection beforehand. In the latest form of apparatus the expired air is purged of carbon dioxide by passage through sodium hydroxide and the acetylene passes in a closed circuit, thus cheapening the anesthesia so that it can compete with ether and reducing the risk of explosion to a minimum, since no acetylene escapes in the room.

#### **ACETYLSALICYLIC ACID (ASPIRIN).—PHYSIOLOGIC**

**ACTION.**—In experiments on aspirin antipyresis in dogs, H. G. Barbour (Jour. of Pharm. and Exp. Ther., Oct., 1926) produced fever by injection of *B. coli* vaccine and gave aspirin 4½ to 6 hours later. The fever was found to have produced a loss of fluid from the blood, ascribed to an escape of whole plasma from the circulation. Aspirin antipyresis was associated with a return of fluid into the blood-stream. In 3 out of 5 animals there was also marked evidence of dilution of the plasma, which showed an increase of 5 per cent. or more in its water content. Possibly the antipyretic drug may act to retard the excretion of the water given with it to a slower rate than its absorption; but one may also assume acquisition of water from the tissues.

**POISONING.**—Hypersensitivity to small doses of acetylsalicylic acid is, as noted by P. J. Hanzlik (Med., Aug., 1926) more common than to the other salicyl compounds. It resembles anaphylactoid phenomena, with exudative features suggesting an increased capillary permeability as the basis of the action, and in which the acetyl group appears to play an important part. Perhaps the lipoid solubility and, therefore, permeability of this drug is better than that of sodium salicylate. Among the symptoms reported are: Constriction and edema

in the throat with dysphagia and salivation; congestion in the nose, and swelling of the eyelids. Kitchin reported the case of a medical student who, 2 hours after taking 5 grains (0.3 Gm.), developed severe angio-neurotic swelling of the face and arms, and after second, third and fourth doses, large urticarial wheals on the trunk and limbs and itching lasting 36 hours. In Sucin's case, after 15 grains (1 Gm.) there was swelling of the upper lip; the swelling soon extended to the entire head and was not relieved by cold applications; deglutition was painful and the pulse and respiration were increased. The drug seems to partake of a narcotic action to some extent, apparently promoting sleep in some individuals.

**ACHONDROPLASIA.**— Conditions superficially resembling achondroplasia but not identical with it are sometimes met with. P. Lewin (Surg., Gyn. and Obst., July, 1927) discusses in particular the condition of *multiple cartilaginous exostoses*, termed by Sir Arthur Keith *diaphyseal aclasis*. This disturbance is confined to skeletal elements in which bone laid down within cartilage comes to be covered by periosteal bone, as in the shafts of long bones. The aclastic condition is most marked and prolonged where growth is most pronounced and prolonged, as at the ends of the femur, tibia and fibula, at the distal ends of the bones of the forearm, and at the proximal end of the humerus. The exostoses occur at the ends of the long bones, especially about the knee, and may be spinous, sessile, pedunculated, oblique or straight. They are usually painless unless traumatized, subjected to pressure, or growing rapidly. Curvature of bone may occur in the forearm or leg. The diagnosis is based on the history, findings, exostoses, and roentgenograms. **Surgical**

**removal** of exostoses is required only for excessive size, interference with function of a joint, muscle or tendon, pressure symptoms, sensitiveness of the exostoses, or repeated trauma which might result in malignant degeneration or fracture. The disorder is also known as *hereditary deforming chondrodysplasia*. It predominates in males (3:1), may be present even at birth, and is rare in the colored race. Puberty is sometimes retarded, and the exostoses have frequently disappeared at this period, suggesting a glandular etiology. Keith believes that the condition is related to achondroplasia and may be due to endocrin disturbance, most likely of the thyroid.

**ACHYLIA GASTRICA.**— Several grades of achylia are defined by Katsch and Kalk (Berlin. klin. Woch., June 18, 1926). In one grade, acid is produced only upon subcutaneous injection of 0.5 mgm. ( $\frac{1}{130}$  grain) of histamine. In the next severer grade, no acid is excreted at all, but when 5 c.c. (80 minims) of 1 per cent. neutral red solution is injected intramuscularly some of it appears in the stomach. In the next grade, histamine yields increased secretion, but no acid. Finally, in the most severe cases, there is no response at all.

**ETIOLOGY.**—Among 128 apparently normal persons, Dahl-Iversen (Bibl. f. Laeg., Mar., 1927) found 11 per cent. with achylia and 24 per cent. more with hypoachylia. In a like number of gall-stone cases there was achylia in 9 per cent. and hypoachylia in 22 per cent. Evidently the lowered chyle secretion in cholelithiasis, and the dyspepsia between gall-stone attacks noted in 40 per cent. of the patients, is explainable on the basis



of the similar condition met with among normal individuals.

That achyilia may be *familial* is emphasized by F. Fernandez Martinez (Med. Iber., Jan. 29, 1927). In 20 or 30 instances he observed achlorhydria in parents as well as children or in 2 or 3 members of a family. In one family 4 generations were involved; 5 of 13 greatgrandchildren had achyilia; in some there were digestive disturbances and several had mental and nervous symptoms.

Achyilia gastrica is divided by J. Friedenwald and T. H. Morrison (Ann. of Clin. Med., Oct., 1926) into 2 distinct types, the primary and the secondary. The first type comprises mainly the congenital forms. The total acidity of the gastric contents is low. Aside from the congenital cases, there are smaller groups: (1) Starting between the 14th and 20th years, sometimes with the onset of menstruation, and not uncommonly in neurasthenics; (2) with apparent remissions—the form due largely to neurasthenia—and (3) following infections, especially in young individuals, and usually continuing after the infection, *e.g.*, typhoid fever or pulmonary tuberculosis, has been overcome. The achylia related to pernicious anemia and combined lateral spinal sclerosis have been emphasized of late; in the former the acid remains absent even during the periods of remission when the blood-picture has returned almost or quite to normal.

Study of 100 cases of achyilia showed that it occurs most frequently between the ages of 30 and 60 years and is more common in females than males (64:36). Only 9 cases were symptomless, but it should be remembered that many instances of

achyilia are detected only accidentally. Fifty-nine cases had gastric symptoms such as anorexia, nausea, local discomfort, occasional vomiting, eructations and heartburn. The remaining 32 cases had slight or no gastric symptoms, but marked intestinal disturbance, *viz.*, constipation in 19 and diarrhea in 13.

In some instances of achyilia, especially in the young, the gastric secretion may return even after a prolonged absence. This is very unusual, however, after the 40th year.

According to K. Faber (Amer. Jour. Med. Sci., July, 1926), achyilia gastrica is of exogenous causation, being due to agencies either directly irritating the gastric mucosa or exerting a toxic action on it through the blood circulation. In either case the anatomical picture of gastritis will eventually develop, and this may lead to more or less atrophy of the gastric glands, but achyilia occurs at such an early stage of the gastritis that it may exist in the absence of any pathologic change in the gland cells. Achyilia tends to persist indefinitely when it has lasted a certain time, and its cause, seldom made out, is to be sought far back in the patient's life, perhaps in childhood. Causes of achyilia in very young children are chiefly parenteral febrile disease and infectious enteritis; the achyilia thus caused is usually transitory. Achyilia in adults results from alcoholism, and from typhoid, paratyphoid or dysentery, tuberculosis, malaria, syphilis, etc. Achyilia in Graves's disease also represents a toxic cause; likewise that of late pregnancy. Upon improvement of the parenchymatous gastritis, when present, the achyilia subsides. Toxic

causes may, however, induce achyilia even before the gland cells show any change. Nervous achyilia can occur, but whether it can become permanent is not yet known. Experimentally, section of the vagi causes only a temporary achyilia. In experimental alcoholic achyilia, the gland cells cease to secrete long before they begin to degenerate. Diphtheria toxin will cause achyilia and gland degeneration. Thyroid extract will cause secretion almost to cease, with return of secretion upon discontinuance, and without any sign of gastritis. The writer regards the congenital theory of achyilia as unproven. The evidence from familial achyilia is inadequate; familial incidence does not disprove an exogenous cause.

**DIAGNOSIS.**—Repeated examinations of the gastric secretion are necessary for the diagnosis of achyilia, as noted by Friedenwald and Morrison (*loc. cit.*). The fractional test meal is the most satisfactory method. Smithies advises a dry meal, for slow passage through the stomach; under this condition many cases of supposed achyilia show merely a diminished secretion. Gompertz and Vorhaus have shown that a true achyilia is best determined by subcutaneous injection of 1 c.c. (16 minims) of a 1:1000 solution of *histamine hydrochloride*.

D. N. Silverman (New Orl. Med. and Surg. Jour., July, 1927) endorses the *histamine test* for true achyilia. Having determined that the stomach fails to secrete acid after food ingestion, he aspirates the fasting gastric contents on a subsequent day. The tube is then left in place, and the histamine injected subcutaneously. The gastric juice is allowed to flow

or is aspirated every 5 minutes. The free HCl in each sample is determined at the bedside by the hydrogen ion concentration method of Denis and Silverman (Amer. Jour. Med. Sci., Jan., 1925). In true achyilia, no acid is secreted following the stimulating injection of histamine. This was uniformly the case in 8 patients with pernicious anemia. On the other hand, 9 out of 10 cases of achyilia attending gall-bladder disturbances responded to histamine with normal to hyperacidity values.

**TREATMENT.**—According to S. Weiss (Amer. Med., Feb., 1927), the diet should be largely liquid or semi-liquid. Barley, rice or chicken broths are serviceable. Vegetables are usually well taken. Peas and beans in purée form provide protein. Potatoes and rice should be cooked with broth or milk, or taken as mush. Meats must be of the most digestible forms: Brains, scraped beef, boiled sweetbreads in small amounts; raw oysters and boiled fish are permissible. Where milk is poorly digested, kefir, koumiss or matzoon may be substituted. Butter may be eaten on crackers, stale bread or toast. In cases simulating hyperchlorhydria,  $\frac{1}{2}$  to 1 glassful of water 1 to 2 hours after meals, when the distress is to be expected, often gives relief. In some cases milk and crackers may be given between meals also with benefit. Small meals should be taken at intervals of 2 or 3 hours. Elsner deems eggs useless in this disorder, the egg albumin remaining undigested in the intestines because of its antitryptic action.

During meals the writer orders dilute hydrochloric acid, 15 to 30 minims (1 to 2 c.c.) in  $\frac{1}{2}$  glass of water with the juice of an orange

added. For anorexia, iron, quinine and strychnine, or condurango, calumba or quassia may be given. **Pepsin** may be combined with the hydrochloric acid. **Papain** or **papayotin**, 5 to 15 grains (0.3 to 1 Gm.), may be of material aid. **Pancreatin**, 15 to 30 grains (1 to 2 Gm.), with **sodium bicarbonate**, may be taken  $\frac{1}{4}$  hour after eating. The following is a useful combination:

R *Tr. nucis vomicae* .... f3iij (12 c.c.);  
*Tr. cinchonae comp.*,  
*Acidi hydrochlorici*  
dil. .... āā f3ss (15 c.c.);  
*Aquae destillatae* .q.s. ad f3iv (120 c.c.).

M. Sig.: One or two teaspoonfuls in water  $\frac{1}{4}$  hour before meals.

**Orexin tannate**, 5 to 15 grains (0.3 to 1 Gm.) in capsule, with a glass of water, 1 or 2 hours before meals, acts well in inducing hunger. **Creosote** and **resorcinol** have a stimulating and antifermentative effect.

R *Resorcinolis* ..... 3j (4 Gm.);  
*Fluidextracti condurango* 3ss (15 c.c.).

M. Sig.: Thirty drops 4 times a day.

**Liquor pancreaticus** (N. F.) may be given in teaspoonful doses after each meal.

**Gastric sedatives** may sometimes be needed for nausea and vomiting. **Strontium bromide**, 10 to 20 grains (0.6 to 1.2 Gm.) in peppermint water, has proven beneficial in the writer's hands. Other sedatives are **chloral hydrate**, **dilute hydrocyanic acid**, **bismuth salts**, **cannabis**, **cocaine**, and **apothecin**. **Orthoform** and **ethyl aminobenzoate**, 3 to 5 grains (0.2 to 0.3 Gm.), have an anesthetic effect on the stomach. **Lavage** is indicated in chronic gastritis with mucous secretion. **Mineral waters** such as Hatherne, Congress and Kissingen are particularly useful. The extraventricular

faradic current, or if there is gastralgia, intraventricular galvanization, may be employed.

The effects of an alkaline and saline mineral water (Essentuki) in 32 cases of achylia were studied by Krestnikova (Russk. klin., Nov., 1926). In functional achylia and pseudoachylia the results were good, but in most patients with organic achylia and in advanced gastritis there was absence of effect or aggravation.

**ACIDOSIS.**—The acidosis attending diabetes is divided by M. Labbé (Monde méd., Apr. 15, 1927) into 3 stages: (I) In this stage the acidosis is latent, being recognized only by the finding of acetone, diacetic acid and betaoxybutyric acid in the urine. The alkali reserve is not lowered, the pH of the blood remains normal, and there is not present, strictly speaking, an acidosis, but merely a *ketosis*. (II) Here the alkali reserve begins to be lowered, as shown by Van Slyke's method of determination, which gives the ratio of carbonic acid fixed to the alkali carbonates of the blood. Instead of the normal 52 to 65 volumes of CO<sub>2</sub> per 100 of plasma, there are present but 50 or 40 volumes, or even less. There now exists *acidosis*, but the acid-base equilibrium is not yet altered; the pH of the blood is normal, and the acidosis is termed a *compensated* one. (III) Here the alkali reserve, now exhausted, no longer insures neutralization of the ketone bodies passing into the blood; acid-base equilibrium is ruptured; the pH of the blood falls below the normal figure (7.30 to 7.40); the acidosis is now *decompensated*, and grave clinical manifestations are imminent.

During the second stage the symptoms are few and hardly characteristic.

They become manifest only when there is an exacerbation of acidosis, with loss of weight, weakness, anorexia and digestive disturbances, vomiting or diarrhea, which may lead to a mistaken diagnosis of alimentary tract or liver disease; or, there may be somnolence, vertigo, insomnia, or mental fatigue, the gravity of which is hardly suspected; lastly, there may be slight dyspnea. In a diabetic, these symptoms are ominous, though not altogether reliable; uranalysis and determination of the alkali reserve are indicated.

The severe acidosis with lowered alkali reserve and blood pH may be subdivided into 2 stages, the premonitory and comatose. In the stage *premonitory of coma*, digestive, respiratory, and nervous disturbances appear in varying order and intensity: Anorexia, obstinate vomiting, and attacks of diarrhea without abdominal distention or pain; Küssmaul's dyspnea, with deep, slow or rapid, breathing; vertigo, staggering gait, heavy feeling in the head, exceptionally delirium or epileptic seizures; progressive somnolence, gradually passing into subcoma and *coma*, distinguished from apoplectic or uremic coma by the urine and blood examinations and history. Complete coma seldom continues over one day before death takes place.

In a study of the *mineral metabolism* in acidosis, Bernhardt (Zeit. f. klin. Med., Dec. 18, 1926) induced in adult human subjects a negative calcium and phosphate balance by giving daily 0.2 to 0.3 Gm. of ammonium chloride per kilo. of body weight. The blood calcium during such treatment was found to increase, while the basal metabolism decreased, unless toxic doses were given, causing dyspnea and restlessness. In children the am-

monium chloride acted more powerfully than in adults.

Detre (Zeit. f. d. ges. exp. Med., June 17, 1927) studied the effect of acidosis on the *red cells* by giving decinormal solutions of mineral acids to dogs. The red cell count was invariably raised throughout the administration of the acids.

**ETIOLOGY.**—Several studies on the relationship of acidosis to *nephritis* have been published of late. F. Rathery and J. Marie (Bull. Soc. méd. des hôp. de Paris, Dec. 30, 1926) note that ketone bodies are only rarely found in the urine in these cases. Acidosis is said to occur more particularly in the cases of nephritis without edema but with chloride retention. Somnolence, delirium, and vomiting in nephritis have at times been ascribed to acidosis. The writers report 3 cases of fatal acute or chronic nephritis with high blood nitrogen and acidosis. The latter was featured by a marked reduction of the alkali reserve and by absence of pH reaction to the sodium bicarbonate test. Typical Küssmaul breathing was observed in 1 instance, but Cheyne-Stokes breathing was uniformly absent. The pH of the blood remained normal (7.35) in spite of a marked drop of the alkali reserve (to 21). The pH of the urine in 2 of the cases was 6.4 and 5.4, reaching 7 in one instance a few days before death. Sodium bicarbonate did not seem to have much effect on the acidotic phenomena, and the alkali reserve remained unchanged.

Experimentally, Seegal (Arch. of Int. Med., Apr., 1927) obtained *casts and albumin* constantly in rabbits by giving decinormal HCl and ammonium chloride over long periods. The acid condition induced was sufficient to lower the plasma carbon dioxide capacity. At autopsy, there was



found acute degeneration of the convoluted tubules, with pyknosis of the nuclei in cases of longer duration. When the giving of acid-forming substances was stopped, the kidney promptly returned to normal. Comparable results were obtained in dogs. A possible causal relation of acidosis to *orthostatic albuminuria* following strenuous exercise is discussed.

According to J. R. Wilson, S. Z. Levine, and H. Rivkin (Amer. Jour. Dis. of Childr., Mar., 1926), a significant ketonuria appears in *children* at consistently lower metabolic fatty acid-glucose ratios than in adults. Furthermore, children excrete a relatively greater quantity of ketone bodies at a given metabolic ratio above the threshold of ketosis. This fact may explain the more rapid development and the greater severity of ketosis in children than in adults. Normal children usually oxidize a higher proportion of carbohydrate and a lower proportion of fat than they receive in their diets. The discrepancy is most marked when the fat content of the diet is relatively high. The tendency to oxidize carbohydrate at the expense of fat was less apparent in a child with *cyclic vomiting* than in control cases. This is offered as a tentative explanation for the increased susceptibility of these children to ketosis. The tendency of children to develop ketosis may logically be counteracted by giving *diets* high in carbohydrate and low in fat, especially in conditions associated with an elevated metabolism.

In *cholera infantum*, Rohmer (Rev. franç. de péd., July, 1927) regularly observed acidosis, which was most pronounced in the fatal cases. It did not seem to have any direct relation to the diarrhea, but was generally

accompanied by a slackening of capillary circulation. There was interdependence between acidosis and high blood nitrogen.

*Post-operative acidosis* has been studied in 17 cases by M. Labbé and M. Chevki (Presse méd., Oct. 2, 1926). The operations were mostly abdominal, with 14 performed under chloroform and 3 under ether. In 9 cases (including 2 ether cases) there was slight acetonuria during the first day after operation; in 3 cases, on the second day, and in 1 case, on the third day. Diaceturia occurred in 2 cases on the second day and in 1 case on the third day. The writers conclude, then, with most other authors, that post-operative acidosis is ordinarily very mild, is inconstant, and is confined to a disturbed metabolism of ketone bodies manifested in urinary findings but no clinical symptoms. The grave post-operative acidosis, capable of causing death, is rare. Post-operative acidosis has been ascribed to pre- and post-operative starvation and purgation, to the disease necessitating the operation, to operative shock, and to a toxic action of the anesthetic. The writers' researches cause them to incline toward ascribing the ketosis to metabolic disturbance due to the anesthetic, with functional insufficiency of the liver as an added important factor.

As for post-operative diminution of alkali reserve, it is more constant than ketosis and apparently independent of it. It was uniformly present in the writers' cases, with 1 reading as low as 36.6. It had not quite returned to normal 48 hours after operation, and sometimes even on the third day. The hydrogen ion concentration of the venous blood had

generally returned to normal, or even exceeded it, 24 hours after operation. The mode of production of such acidosis is as yet unexplained. The writers were struck, however, by the marked increase of organic acids excreted in the urine; the amount of these substances was often doubled, in spite of the abstention from food. This suggests that non-ketonic organic acids, incompletely broken down, may be the cause of post-operative acidosis. Probably there are other factors, Hasselbach and Lundsgaard having shown that the mere placing of a rabbit on his back causes a steady reduction of the blood pH.

According to M. Herz (Zent. f. Chir., July 3, 1926), continuous vomiting due to the anesthetic, precluding retention of food or fluid, is at the bottom of post-operative acidosis in muscularly weak or paralyzed children, the small carbohydrate reserve of such children having been readily exhausted. **Glucose** in large amount should be given pre-operatively, and if acidosis develops, **insulin** used in addition.

**DIAGNOSIS.**—The clinical picture of acidosis in *diabetes* is not sufficiently characteristic to reveal the condition early nor to indicate its severity. As noted by Labbé (Monde méd., Apr. 15, 1927), the 2 main factors in the diagnosis are the determination of the ketone bodies and that of the alkali reserve. Increase of ketone bodies in the urine and lowering of the alkali reserve are not always in agreement. Slight acetonuria may occur in a patient with markedly lowered alkali reserve, and *vice versa*. This discrepancy depends upon a varying capacity of the kidneys to excrete the ketone bodies. It is in the very cases in which the excretion is

poor that the alkali reserve decreases the most, whereas in cases of coma recovering under large doses of alkali, large amounts of ketone bodies have always been recorded (230 Gm. in 24 hours in one of the writer's cases). As might be expected, the amount of ketone bodies in the *blood* and the lowering of alkali reserve show greater concordance, but even here the agreement is not absolute. Determination of the alkali reserve in diabetic acidosis is of greater prognostic value than that of the ketone bodies in the urine.

Albano and Vecchiarelli (Policlin., Sept. 15, 1927) deem the alveolar carbon dioxide tension index (acidosis index) of great value in *urology*. Its findings correspond to those of the blood nitrogen and other functional urologic tests, but it is more sensitive than the blood nitrogen, and may be regarded as superior to the latter for excluding extrarenal factors. Where the acidosis index and blood nitrogen are in disagreement, the former proves the more reliable and significant.

**TREATMENT.**—The results of treatment by sodium bicarbonate in acidosis have been discouraging, and those from glucose alone, unreliable. E. L. Irwin (Amer. Jour. of Surg., Apr., 1926) praises the combined **glucose** and **insulin** treatment, used for 2 years at the Charity Hospital of New Orleans in all cases of acidosis without a failure. The milder cases can frequently be cleared up by oral use of carbohydrates in the form of **orange juice** or stick **candy**. In the more advanced cases, **glucose**, 5 per cent. by **hypodermoclysis** or 10 per cent. **intravenously**, supplemented by **insulin** in the ratio of 1 unit to each 2 or 3 Gm. of glucose, should now be the accepted treatment. Overdosage of glucose need not be feared, the ex-

cess being eliminated by the kidneys. Even insulin overdosage is not alarming, since glucose is a specific antidote. The administration may be repeated as often as necessary. A child with acute suppurative appendicitis and peritonitis, complicated by severe acidosis, received 5 quarts (liters) of 10 per cent. glucose with corresponding doses of insulin in 24 hours, and was saved by the procedure. Upon giving glucose-insulin vomiting ceases, acetone disappears from the urine and breath, and the state of acidosis is instantly relieved.

Labbé (*loc. cit.*) apprehends no harm from **fasting** in *diabetic acidosis*, and even regards it as a means of combating a threatening acidosis. Meats are to be prohibited, while fats may be given in fairly large amounts. He relies chiefly, however, on **green vegetable cures**, which constitute a sort of half-fast, and the food value of which may be supplemented at will with fat or protein foods. When acidosis has disappeared under the green vegetable diet and **insulin**, these supplementary foods are added. With insulin available, **sodium bicarbonate** is less useful than formerly, yet may be of use to restore the alkali reserve in an acidotic case receiving insulin. The latter relieves acidosis, not by improving carbohydrate metabolism, but by a direct action. This action on the metabolism of the fatty acids and lipoids is more rapid and intense than that on the carbohydrate metabolism, as shown by Widal, Chauffard, and Labbé. In diabetes with acidosis, the writer uses insulin to dispel acetonuria and raise the alkali reserve. Rather large amounts of insulin should be given till the alkali reserve is restored to normal, and the

amount then reduced to a "maintenance" dosage, to be checked from time to time by alkali reserve determinations.

The acidosis occurring in the *diarrhea of infants and young children* is not, according to A. H. Hoge (Va. Med. Mthly., Feb., 1926), the result of excessive production of ketone bodies, although these are at times increased. It is due in part to failure of the kidneys to eliminate acid phosphate, caused, in turn, by the fact that so much fluid has been lost from the body by other channels that urine secretion becomes almost impossible (often reduced to 1 or 2 ounces daily). The treatment calls for **fluids by mouth, intravenously, intraperitoneally**, or by any other route. **Glucose** and **insulin** should also be used.

In 9 cases of severe *post-operative acidosis*, with severe and continuous vomiting, flushed face, lips and tongue dry and parched, restlessness and weak pulse, Hoge controlled the vomiting entirely in 12 to 36 hours with intravenous **glucose** and **insulin** in 8 cases. The remaining case died suddenly on the 9th day after his acidosis had almost cleared up. The writer adds the insulin directly to the 5 per cent. glucose solution. To 1000 c.c. of the latter can be safely added 1 c.c. of U-20 insulin, *i.e.*, 20 units of insulin. According to L. Urrutia (Arch. de med., cir. y esp., July 23, 1927), insulin is indicated in post-operative acidosis whether ketosis or decreased alkali reserve, or both, exist.

Prophylactically, Beresow, Kuchowarenko and Lifschütz (Arch. f. klin. Chir., Jan. 29, 1927) in 18 cases gave 400 c.c. (12 ounces) of 5 per cent.

glucose solution and 10 units of insulin intravenously on the day before operation, and on the day after the operation, in some instances, the same dose of insulin without glucose. On other days insulin was given after a glass of sweetened tea. In only 1 case did acetonuria occur, lasting 1 day. In 4 cases of actual post-operative acidosis with marked acetonuria similar treatment was applied, with the result that all symptoms passed off on the same day except in 1 case, in which acetonuria persisted till the next day. These authors likewise applied the treatment in 3 cases of *surgical shock* with high blood sugar, giving 500 c.c. (15 ounces) of glucose solution and 20 units of insulin. The symptoms began to subside in  $\frac{1}{2}$  hour. Good results are also reported in 7 cases of *cachexia* and severe *anemia* in patients subjected to resection of the stomach for cancer. Glucose and insulin were given for 2 or more days before operation and for 4 or 5 days after it, with saline proctoclysis to make up for the diuretic effect of the insulin. Later glucose was continued for 5 days without insulin. Fickewirth (Zent. f. Chir., July 2, 1927) advises a diet rich in **vitamins** in the prophylaxis of post-operative acidosis.

The following symptoms are mentioned by J. Sobel (Amer. Jour. of Surg., Nov., 1926) as pointing to impending or existing post-operative acidosis in *children*: Drowsiness, irritability, mental sluggishness, hyperpnea, headache, nausea and vomiting, abdominal pain, desiccation or dehydration, diminished urinary output, cherry red or cyanotic lips (occasionally), unconsciousness, coma. General care of these children comprises **quiet**, proper **covering** and **warmth**; **heat** to

the **extremities**; **hot water bag** for abdominal pain; **colonic irrigation** of soapsuds and hot water; **gastric lavage** with 5 per cent. **sodium bicarbonate** solution for persistent vomiting. If the patient can swallow, 2 to 3 ounces (60 to 90 c.c.) of **orange juice** with 5 to 10 Gm. (75 to 150 grains) of **glucose** should be given every hour for 2 or 3 doses, or **warm water**, 1 or 2 ounces (30 or 60 c.c.) every  $\frac{1}{2}$  to 1 hour, or **sodium bicarbonate**, 1 teaspoonful in a glass of tap water sipped every 15 to 30 minutes, or **corn syrup**, 1 or 2 tablespoonfuls in  $\frac{1}{2}$  to 1 glass of water sipped every 15 to 30 minutes. By rectum, one may give by the gravity method (strapping the buttocks, if necessary), 150 to 250 c.c. (5 to 8 ounces) of 5 or 10 per cent. **glucose in saline solution** 2 or 3 times daily, or 5 Gm. (75 grains) of **sodium bicarbonate** in 150 c.c. (5 ounces) of warm water 2 or 3 times daily. (Bicarbonate to be stopped when urine becomes neutral to litmus.) Subcutaneously, 15 to 25 Gm. ( $\frac{1}{2}$  to  $\frac{5}{8}$  ounce) of **glucose** in 150 to 250 c.c. (5 to 8 ounces) of warm **saline solution** every 4 hours, or 250 c.c. of **saline solution** alone, may be given. Intravenously, 25 Gm. ( $\frac{5}{8}$  ounce) of **glucose** in 250 c.c. of **saline solution** 2 or 3 times daily is suitable. The fluids are to be forced, and given warm and slowly, to the amount of about 10 per cent. of the body weight in 24 hours, or, as to glucose, according to Schloss, 20 c.c. (5 drams) of a 10 per cent. solution per kilo. of weight. In severe cases 10 or more units of **insulin** may be added to the intravenous solution. Other medicinal remedies are: Strong **coffee by rectum**; **digitalis** hypodermically; **adrenalin**, 5 to 15 minims (0.3 to 1 c.c.)



hypodermically, and **coramine**, 0.5 to 1 c.c. (8 to 16 minims) hypodermically. Foods, to be begun cautiously when fluids are retained and consciousness is complete, comprise orange juice, dextrose, cereals, milk and sugar, toast, crackers, corn syrup, and cooked vegetables. The return to fats should be slow.

Treatment of acid intoxication with **buffer solutions** is advocated by F. A. Hecker (Jour. of Lab. and Clin. Med., Feb., 1927) in view of the fact that the blood in such cases shows a depletion of the buffers, *vis.*, sodium bicarbonate and disodium phosphate. The indication for such solutions was taken to be a urine having a pH of 5.00 or less, as tested with the hydrogen ion apparatus. Freshly distilled water, 500 c.c., is divided between 2 flasks, to one of which is added 4.25 Gm. of C. P. sodium chloride. The dose of alkali to be given is calculated as  $\frac{1}{2}$  to  $\frac{1}{4}$  of the weight in grams per kilogram of body weight, with a ratio of 2 parts of sodium bicarbonate to 1 part of disodium phosphate minus 4.25 Gm. of the sodium chloride. The weighed salts are dissolved in the contents of 1 flask, and the rest of the sterile water added. With a burette, a 10 per cent. solution of mono-potassium phosphate, a beaker and the hydrogen ion apparatus, the solution is now titrated and adjusted to a pH of 7.00, then filtered through sterile cotton. The solution is administered intravenously from a flask with attached syringe tubing and needle, in the course of 15 to 20 minutes. The reaction consists of a chill of varying severity, fever, usually sweating, and sometimes delirium and restlessness. The treatment has been applied in 105 cases of various kinds, all desperately ill. Among the diseases mentioned are diabetes, erysipelas, eclampsia, puerperal sepsis, sapremia, pneumonia and nephritis. Sixty-five cases recovered and 36 died, while 4 showed little or no improvement from the treatment but recovered.

**ACIDOSIS TESTS.**—The following rapid office test for estimating acidosis has been described by L. M. Breed (Jour. Amer. Med. Assoc., Oct. 30, 1926): One c.c. of freshly drawn whole blood is added to 15 c.c. of acetone-free methyl alcohol in a 25-c.c. volumetric flask. The mixture is shaken thoroughly, and filtered into a 100-c.c. beaker. A few drops of phenolphthalein are added as indicator to the filtrate, which is then evaporated, just to dryness, over a water-bath. The residue is redissolved in 10 c.c. of distilled water, and compared with 10 c.c. of phenolphthalein solution in the same sized beaker. If the color matches, acidosis is not present; if no color is evident, acidosis exists. For exact notation, the writer divides the acidosis into 6 grades, according as the color, matching the standard, remains for 6, 5, 4, 3, 2 or 1 hours, these grades corresponding to the following carbon dioxide percentages by volume (Van Slyke): Over 72, 67-71, 63-67, 61-63, 55-60 and 44-48. Absence of color corresponds to a carbon dioxide reading below 37. The phenolphthalein standard solution for this test is made by dissolving 1 c.c. of H. and W. phenolsulphonphthalein in 1000 c.c. of distilled water. The reagents must be kept and the test performed in a room free from acid fumes.

**ACNE.—ETIOLOGY.**—In a study of the staphylococci in acne vulgaris, W. N. Goldschmidt (Arch. f. Derm. u. Syph., Aug., 1925) found no variety of this organism present in any type of acne lesion that was not present in equal or greater numbers on the skin of normal persons. The majority of colonies were white. *S. pyogenes aureus* and *citreus* were conspicuous by their absence.

In *acnitis*, also known as *acne agminata*, J. F. Schamberg and M. J. Harkins (Arch. of Derm. and Syph., Mar., 1925) found staphylococci and a Gram-negative, rod-shaped organism which they called bacillus X. An emulsion of the excised nodule

injected intraperitoneally in a guinea-pig produced a generalized pustulocrustaceous eruption followed by ulceration. The bacillus belonged to the colon group, but differed from the ordinary colon bacillus in its virulence for animals and certain cultural and biologic characteristics. That acnitis is an infectious granuloma, according to these writers, there can be little doubt. E. R. Maloney (*ibid.*, Mar., 1927) classifies acnitis as one of the tuberculides. The general failure to find tubercle bacilli and produce tuberculosis in animals would indicate that the disease is not a true tuberculosis, but may possibly be accounted for by the toxin theory. Yet, the histologic picture in all cases has been that either of a tuberculous granuloma or of an arrangement closely simulating it, and the writer regards the disorder as a true *tuberculosis of the skin*, probably a manifestation of allergy in a person with an active or latent tuberculous focus.

Two cases of *chlorine acne* have been reported in detail by J. Nicolas and M. Pillon (Paris méd., Jan. 16, 1926). The condition is relatively rare, but the cases are strikingly similar and characteristic. The eruption consists almost entirely of comedones, of varying size and often practically confluent. Nearly always, between the typical comedones, are small cysts of varying size, containing either ordinary sebaceous matter or a milky fluid resembling thick pus. The face is most abundantly involved, including the ears. The nose, however, may partly or wholly escape. The scalp may be affected. The neck, trunk, abdomen and genitals are involved in varying degree. The limbs are often the least affected.

The eruption extends over the body in a few weeks. It seems to resolve spontaneously upon cessation of exposure. Once cured the workers, it is said, may resume the same occupation with impunity. Many theories as to the pathogenesis of the lesions have been advanced, but none seem proven. Chassevant found that the fatty masses from the lesions have a higher melting-point than those from ordinary acne, and are comparable to the product obtained by treating fats with nascent chlorine. Some have held that the condition is due to substances other than chlorine. The patients are usually producers of electrolytic chlorine or hydrochloric acid, but the men affected are particularly those who clean or repair the apparatus used. The writer endorses the conclusion of Sisley that compounds of tar with chlorine, *viz.*, chlorine derivatives of naphthalin produced through the action of chlorine on carbon electrodes in which tar is used as binder, may be the cause of the condition. Among the workers in the factory in which the writer's second case was employed, only men who handled anodes used in the electrolysis of sodium chloride were affected. Teleky (Klin. Woch., May 7, 1927) has similarly observed severe acne in workers handling a *chlorinated naphthalin* known as "perna."

**TREATMENT.**—According to E. H. Molesworth (Med. Jour. of Austral., July 3, 1926), the most important part of treatment in acne vulgaris is the prevention of "next week's black-heads" and "next month's pimples" by emptying the glands which are as yet not blocked or only incompletely blocked. This is to be done by a system of vigorous **pinching massage**

—just short of bruising—of the whole **acne-bearing area**, so that the pressure extrudes the contents of the glands and carries with them the commencing obstructions of bacillary colonies and their products situated in the neck of the follicles. The patient is told to wash the face in very **hot water** and lather it with plain toilet **soap**, then steep it in the water, renewing the breath and repeating the process until the face is flushed and hot. It is explained that this is to soften the waxy material. Then the pinching process is explained and illustrated, and the patient is told to pinch till it hurts a little, the pinching being continued for 2 or 3 minutes. The area, now greasy, is scrubbed with a cotton swab saturated with a mixture in equal parts of **ether** and **alcohol**. After this, a 0.1 per cent. solution of **mercury bichloride in alcohol** is used. No ointments should be employed, but permission may be given to use sparingly an inert face powder. The drill above described is carried out every night for 2 months (in severe cases in the morning as well), and with practice can be performed in 5 minutes. After 2 months it can generally be reduced to alternate nights and finally to twice a week, this to be continued until the end of the acne age—about 22 years.

The **X-rays** act well in acne by depressing the sebaceous secretory function, but only temporarily; the treatment cannot be repeated for the period required without grave risk of causing a chronic radiodermatitis. In very severe *acne indurata*, Molesworth uses as preliminary a  $\frac{3}{4}$  erythema dose of X-rays generated by a current at 130 kilovolts, filtered through 1 mm. of aluminum, to get the condition quickly

under control and hearten the patient. **Vaccine treatment** is very capricious. He uses it in bad cases that have relapsed after X-ray treatment at other hands.

W. G. Smith (Irish Jour. of Med. Sci., July, 1927) usually employs **tincture of iodine** and 1:3 of **phenolated glycerin**, forced into the interior of the nodule by a blunt-pointed stick, twisted round in it. An ointment of **ammoniated mercury** or **calomel** is then rubbed in.

The treatment of *juvenile acne* should be differentiated from that of the adult types, according to E. D. Chipman (Cal. and West. Med., Nov., 1927), the seborrheic status being paramount only in the former. In girls of acne age, the constipation or anemia sometimes met with calls for **laxatives**, **iron**, **arsenic**, and **general hygienic directions**. Any excess of **sweets** should be **curtailed**, but the average diet for acne is often unnecessary. Locally, to establish normal drainage, the writer removes as much of the surface detritus as possible with strongly **alkaline soaps** and the application of active **keratolytics**. Nothing surpasses a good **laundry soap**, but green soap or its tincture may be used. In conjunction with this, **cold water** improves the tone of the skin. The initial treatment consists usually of **incision** of pustules, preferably with an iridectomy knife. Some of the more pronounced comedones are extracted at the second visit. Epithelial detritus is removed with a 10 to 15 per cent. **resorcinol paste**, applied nightly for 1 week or more. If its keratolytic action is then judged sufficient, a mild **sulphur lotion** is substituted; if not, the resorcinol is continued. The fundamental cause,

excessive activity of the sebaceous glands, is attacked by the **X-ray**, which by its selective action on the sebaceous glands reduces their size and activity. Ordinarily, fractional doses of  $\frac{1}{4}$  to  $\frac{1}{6}$  unit are employed weekly for 4 to 6 weeks and then continued biweekly up to 8 or 12 treatments. Often the reduction in oiliness is striking. The resorcinol paste may be used intermittently during the X-ray course without harm. The **ultra-violet ray** yields improved drainage following exfoliation, but the resorcinol will give the same result with less trouble.

**ACNE ROSACEA.**—Complete gastrointestinal examinations made by R. H. Rulison (Amer. Jour. Med. Sci., July, 1927) on 50 rosacea patients showed that  $\frac{2}{3}$  had a group of functional abnormalities occurring with sufficient uniformity to suggest that they form an essential part of the disease. These abnormalities were: A neurotic tendency, subnormal weight, low blood-pressure, poor muscle tone, faulty posture, visceroptosis, chronic constipation, spasticity of the large bowel, and gastric subacidity. Correction of these conditions, together with local treatment, usually yields rapid and lasting improvement.

Locally, after freeing the face from grease, daily use of an astringent lotion such as **lotio alba compound** or a weak **resorcinol** or **salicylic acid** lotion is usually adequate. As the skin toughens, the application must be strengthened until the dilated capillaries have sufficient support to render them invisible. Any remaining larger vessels can be destroyed by **electrocoagulation**.

Internally, if subacidity is found, 1

dram (4 c.c.) of **dilute hydrochloric acid** in a glassful of water, possibly with the juice and pulp of an orange added, should be taken gradually during each meal (this to be the only liquid allowed with food). Two or 3 glasses of water are taken  $\frac{1}{2}$  hour before meals. Coffee, tea, alcohol and condiments must be permanently eliminated from the **diet**. Sauces, gravies, meat extracts and hot meat soups are forbidden. Meats should be simply prepared and taken in small amounts. Vegetables rich in essential oils should be eaten sparingly, bulky green vegetables in abundance. There is no objection to fruits. A moderate amount of carbohydrates must be allowed.

Graded **exercise** is required, with special attention to the abdominal muscles. Patients with ptosis should wear an **abdominal binder** until exercise has improved their muscular tone. **Mineral oil** is given for the constipation. If the stool is small **agar flakes** in teaspoonful doses are given once daily. Small doses of **tincture of nux vomica** may be added to the hydrochloric acid to improve nerve tone. This treatment should be persisted in for several months.

**ACNE VARIOLIFORMIS.**—R. Sabouraud (Paris méd., Jan. 16, 1926) points out that there occur certain mild and atypical forms of this condition—also known as *necrotic acne*. Thus, its lesions are sometimes found arising beneath the scales of Unna's seborrheic eczema, particularly in the localization termed by him *corona seborrhæica*. Again, upon scraping off the greasy scales of pityriasis, especially in persons about 40 years of age, one not infrequently en-



counters between them small lenticular crusts, perifollicular in distribution, which constitute an actual acne varioliformis, persisting alone years later, after the greasy scales have disappeared. In young patients with acne varioliformis, and in older patients who are thin, local treatment alone may cure the disease, but in old stout persons, recurrences are common. The disorder occurs generally in individuals who overeat. **Abstinence from bread** is an important therapeutic measure, which alone will reduce the body weight by  $\frac{1}{2}$  kilo. (1.1 lbs.) a month and put an end to the previously recurring eruptions. Locally, **sulphur** is the remedy of choice, a 1:30 ointment, with or without **resorcinol** in the same ratio and a **mercurial**, being applied daily. Where seborrheic scales or steatoid pityriasis coexists, the following ointment should be applied every night and washed off with soap in the morning:

℞ *Olei cadini*,  
*Adipis lanæ hy-*  
*drosi*,  
*Petrolati* .....āā 3iiss (10 Gm.);  
*Sulphuris præcip-*  
*itati*,  
*Resorcinolis*,  
*Hydrargyri sul-*  
*phidi rubri* .āā gr. xv (1 Gm.).—M.

With the above treatment, the writer has yet to meet with an incurable case.

**ACRIDINS.**—**Acriflavine** is included among the antiseptic drugs which have been injected intravenously in **septic states**. E. L. Walker and M. A. Sweeney (Jour. of Pharm. and Exp. Ther., Jan., 1926) have sought to provide an experimental basis for this form of therapy, infecting mice intraperitoneally with various bacteria in such dosage as to cause death usually in 24 hours, and then injecting one of several

drugs intraperitoneally or subcutaneously. The latter method was, of course, the more significant as regards the value of the drugs for systemic antiseptics. In a fair proportion of instances the lives of the animals were saved or prolonged by such medication, whereas all the controls died. Acriflavine, however, proved ineffective against staphylococcic and streptococcic infections when distributed to the bacteria by the circulating blood. It was more effective in staphylococcic than in streptococcic infection when brought into direct contact with the bacteria (intraperitoneal injection). Mercurochrome in streptococcic infections was equally though feebly effective by subcutaneous or intraperitoneal injection. Gentian-violet was effective subcutaneously only in staphylococcic infections.

Clinically, C. F. Tenney and J. Lintz (Arch. of Int. Med., Mar., 1926) gave acriflavine intravenously in a 1 per cent. freshly prepared sterile solution in 11 cases of generalized infection (dose, 5 mgm. per kilo.), but could perceive no improvement from its use. A. Lemierre (Paris méd., Dec. 5, 1925), in 1 case of **sepsis**, probably staphylococcic, following furunculosis, witnessed prompt improvement and convalescence after intravenous injections of 0.5 Gm. of tryptaflavine (acriflavine), but in another case, known to be staphylococcic, witnessed failure. Some cases of streptococcic sepsis which recovered after acriflavine were unaccompanied by endocarditis and might have recovered spontaneously. On the other hand, Zadoc-Kahn, Ogliastri and Wauthier (Gaz. des hôp., Dec. 15, 1926) report a case of grave **gonococcic septicemia** with ocular complications in which daily injections of gonacrine (acriflavine), with treatment by a fixation abscess, seemed to exert a decisive effect on the course of the disease. Five intravenous injections of acriflavine on successive days were given, followed by further injections on alternate days until the joint involvements disappeared.

**TOXICOLOGY.**—A case of sloughing of the urethra following the local use of a 10 per cent. solution of acriflavine for beginning acute gonorrhea is reported by W. G. Schulte (Cal. and West. Med., July, 1927). The patient had injected the solution 3 times daily, causing intolerable pain by the

third day. Upon further injections of the solution diluted  $\frac{1}{2}$ , urination became difficult. The penis was swollen and a yellow necrotic mass 3 mm. in diameter protruded from the urethra. After 10 days a cast of the urethra 2 cm. long was discharged. Recovery with but slight stricture took place under immersion of the penis in hot 1:10,000 potassium permanganate for  $\frac{1}{2}$  hour daily, followed by a 10 per cent. calomel ointment dressing,  $\frac{1}{2}$  grain (0.03 Gm.) of acriflavine internally 3 times daily after meals, and sounding every other day after the slough separated.

**ACROCYANOSIS.**—Peugniez (Trib. méd., Jan., 1928) has reported a case of acrocyanosis in which thyroid medication led to recovery in a few days; the patient was still in good health 2 years later. The young girl of 19 years had had the typical cold and purplish forearms, hands, legs and feet, with firm edema. Exposure to cold was almost unbearable, and the affected tissues were painful almost constantly. Léopold-Lévi holds that acrocyanosis relates to hypothyroidia, and that the attending vasomotor disturbances are in some cases dispelled by thyroid treatment. Laignel-Lavastine prescribes 0.025 Gm. ( $\frac{5}{13}$  grain) of thyroid twice daily as well as 2 of the following pills daily: Quinine hydrochloride, 0.08 Gm. ( $1\frac{1}{4}$  grains); ergotin, 0.02 Gm. ( $\frac{1}{3}$  grain); powdered digitalis, 0.005 Gm. ( $\frac{1}{12}$  grain). The affected parts are massaged with the fingers covered with the following ointment: Extract of hamamelis, 0.06 Gm. (1 grain); ergotin, 0.04 Gm. ( $\frac{2}{3}$  grain); sapolan, 20 Gm. (drums); ichthyol, 1 Gm. (15 grains); cold cream, 30 Gm. (1 ounce). Every hour the fingers are alternately flexed and extended for 1 minute. Once weekly Lugol's solution is applied, and on the intervening days the

following: Borax and alum, of each 5 Gm. (75 grains); rose water, 300 c.c. (10 ounces); tincture of benzoin, 15 c.c. ( $\frac{1}{2}$  ounce).

**ACRODYNIA.**—A fairly considerable number of cases of this disorder—also known as *erythredema*, *pink disease* and *Swift's disease*—has been reported in the United States. C. J. White (Jour. Amer. Med. Assoc., Oct. 2, 1926) points out that the disease occasionally occurs in adults, recording 2 cases, and endorses the following classification of the symptoms by Foerster and Rodda: (1) General or gastrointestinal, as anorexia, loss of weight, weakness, usually pronounced constipation, and occasionally loss of teeth; (2) neurologic, as hyperirritability, paresthesia, anesthesia, loss of reflexes, photophobia and paresis; (3) cutaneous, consisting of (a) general, a diffuse erythematous rash over the entire trunk, usually involving the extremities and often preceded by a profuse perspiration, and (b) local, giving the characteristic appearance of the hands and feet, as erythema, swelling, cyanosis, coldness, ulceration and desquamation. The red, painful palms and soles of the "raw beef" type are so unusual as almost *per se* to rule out all other diagnostic possibilities. M. Péhu and P. Ardisson (Paris méd., Nov. 6, 1926) note that a number of authors have stressed the frequency of tachycardia persisting for several months, the pulse rate being 120 to 140; the systolic blood-pressure is raised. The duration of the disease averages 6 months; cases lasting only a few weeks are exceptional. Complications are uncommon, comprising skin abscesses, gangrene, dental changes,

neurokeratitis, pyelocystitis, and bronchopneumonia.

**ETIOLOGY AND PATHOLOGY.**—W. Powell (Boston Med. and Surg. Jour., May 27, 1926) believes, with Byfield, Rodda and others, that acrodynia is caused by some organism which finds a lodging-place in the upper respiratory tract, *viz.*, in the tonsils, adenoids, sinuses, teeth, mouth and gums.

The essential pathologic changes in 2 cases coming to necropsy were found by E. S. Warthin (Arch. of Path. and Lab. Med., Jan., 1926) to be extreme edema and slight meningeal irritation of the central nervous system, chronic erythema of the skin with hyperkeratosis, hypertrophy of the epidermis and sweat glands, with slight pigmentation of the rete, occurring in children of the hypoplastic lymphatic constitution, with associated or terminal respiratory infections and gastrointestinal catarrh and inanition. The 2 cases did not support the theory of a polyneuritis, nor justified the term "erythredema," showing no edema of the corium. They showed no evidence as to a specific infectious etiology, nor a relationship with tonsillar disease. The skin and central nervous changes suggested the early erythema stage of pellagra. The skin changes are identical with those of certain forms of light sensitization, xeroderma, and fagopyrism, and also with certain stages of X-ray and ultra-violet ray erythemas. The anatomic picture suggests either a food deficiency or a toxic state acting on persons of hypoplastic constitution, affecting the reticulo-endothelial system of meninges and skin, the vegetative nervous system, and possibly leading to a light sensitization.

**TREATMENT.**—Five cases have been reported by G. B. Sweet (Arch. of Ped., Aug., 1925) in which the **mercury quartz lamp** was employed for 5 to 10 minutes at intervals of 3 days, in conjunction with the **radiant heat** of a carbon filament lamp, to warm the patient thoroughly before and during treatment. Improvement was manifest after the 3d treatment, and exposure to the ultra-violet rays was necessary only an average of 8 times up to complete disappearance of symptoms.

According to F. C. Rodda (Amer. Jour. Dis. of Childr., Aug., 1925), acrodynia is usually preceded or accompanied by an upper respiratory infection. In his 17 cases, early recognition of the disorder and prompt **removal of tonsils and adenoids** was followed by speedy recovery in all instances. In 1 case with the tonsils inflamed and hypertrophied, Powell (*loc. cit.*) witnessed rapid recovery following tonsillectomy. From experience with other cases he believes there is no reason for not doing a tonsillectomy routinely. Sometimes the infection is not in the tonsils; once it is evident either in sinuses, gums, adenoids or teeth, and the **focus cleared up**, recovery should be rapid. These procedures failing, **symptomatic treatment**, along with **heliotherapy** and a **high caloric diet** rich in **vitamins**, is indicated.

In a case reported by Wiggelendam (Nederl. Tijd. v. Gen., July 16, 1927), improvement occurred under a diet rich in vitamins; **adrenalin** solution, 0.3 c.c. (5 minims) subcutaneously on alternate days, and a non-specific **bacterial autolysate** on the intervening days. In one of White's (*loc. cit.*) cases in adults, cure was obtained in

30 days under absolute rest in bed, a forced diet of fresh fruits and fruit juices (especially orange), and green vegetables, symptomatic medication, and soothing applications locally.

**ACROMEGALY.**—O. Hirsch (Lancet, June 25, 1927), having observed more than 30 cases of acromegaly, deems it justified to divide the disorder into 2 forms, which occur in about an equal number of cases, *viz.*, (a) benign (or classical), and (b) malignant, acromegaly. Pathologically, the criterion in these 2 groups is the benign or malignant tumor of the hypophysis. The clinical criterion is visual disturbance, which never occurs in the benign form. In the malignant form the ocular troubles appear either simultaneously with the developing acromegaly or after a varying interval which may cover several years. They are nearly always progressive.

*Benign acromegaly* is caused by a tumor developing mainly within the pituitary fossa and thereby widening it towards the sphenoidal sinus. Very frequently, it is associated with hypertrichosis of high degree. Genital disturbances do not occur so regularly as in the malignant form and in all the other types of disease of the hypophysis; it is fairly common to see females with regular or only slightly altered menses, and males with scarcely disturbed or well-preserved potency. The changes observed in this form pertain especially to the parts derived from the ectoderm. Thus one finds, besides the hypertrichosis, an influence on the sebaceous and sweat-glands (numerous comedones, excessive sweating), thickening of the skin with corruga-

tion, hypertrophy of the lingual epithelium, striking defects of the dental enamel, and disturbances in the growth of nails. There are often violent headaches—at least in the first years and during exacerbations. This symptom is due mainly to the endocrin derangement. The pathological lesion of benign acromegaly is a benign adenoma in the anterior lobe, and consists mainly of eosinophile cells. Genuine diabetes mellitus is infrequent; often there is reduced tolerance for carbohydrates. With the present improved surgical technic, the writer deems it safe enough to operate even on these benign cases.

In *malignant acromegaly* there is a clinically malignant tumor, instead of the stationary tumor of benign acromegaly. The optic chiasm, lying on top of the tumor, is pressed against the circle of Willis. In this form, hypertrichosis of the face and trunk is rare. There are even cases with loss of beard and axillary hair. Genital disorders are found as regularly as in dystrophia adiposogenitalis. The violent headache of benign acromegaly is usually not observed, though the tumor is far larger. Adiposity may be present.

In an analysis of 100 consecutive cases of acromegaly, L. M. Davidoff (Endocrinol., Sept.-Oct., 1926) found that all belonged to the white race, and 21 per cent. were Jewish. The 2 sexes were about equally affected. The disease begins usually between 18 and 35 years, with an average age of onset of 26.9 years. There was a family history of acromegaly in 4 per cent. of the cases, and in 20 per cent., a family history of noticeably large individuals. The fecundity of the patients was below the usual average.



A very large number of symptoms were recorded, pointing to the far-reaching effects of this disease. The part played by the pars anterior is undeniably of primary importance.

According to H. Cushing and Davidoff (Arch. of Int. Med., May, 1927), acromegaly bears the same relation to pituitary insufficiency as exophthalmic goiter does to myxedema, *i.e.*, is an expression of hyperpituitarism. It is often attended with a high basal metabolic rate, and the reverse condition of hypopituitarism, by a subnormal rate. Furthermore, there is often a palpably large thyroid, with symptoms suggesting thyrotoxicosis, to which the increased metabolic rate has generally been ascribed. Operations in acromegaly with high metabolic rate, however, even in the absence of a palpably enlarged thyroid, are followed by a fall in the rate almost as uniformly and strikingly as are operations on the thyroid in exophthalmic goiter. The chromophilic cells of the anterior lobe probably secrete a substance which not only contains the hormone of growth but is also capable of raising the metabolic rate. The same observers (*ibid.*, June, 1927) believe that the meliturias which occur in about 25 per cent. of all cases of acromegaly are primarily hypophyseal, even though the pancreatic islets doubtless play a secondary rôle in their production.

Acromegaly stands apart from other endocrin disorders in its striking secondary effects on the other ductless glands, notably in an adenomatous hyperplasia of the thyroid, hypertrophy or adenomatosis of the suprarenal cortex, adenomatous changes in the parathyroids, and diminished gonadal activity.

Castex and Schteingart (Rev. de la Soc. de med. int., Buenos Aires, May, 1927) found the basal metabolic rate increased in 3 cases out of 7, and normal in 4. In one case the rate reached +31. The rate is increased in simple acromegaly, but not in acromegaly complicated by change in the tubers or the posterior pituitary lobe.

**TREATMENT.**—Pituitary tumor is now operated on relatively often for the relief of headache and the preservation of sight. In a case of acromegaly of 7 years' standing in a man of 36 years, reported by M. Bernstein (Boston Med. and Surg. Jour., Dec. 30, 1926), a **sella decompression** by the transphenoidal route was performed for these purposes. A portion of a tumor was removed which proved to be a large adenoma of the hypophysis. He later had 2 **radium** exposures by the nasal route. From the operation until his sudden death nearly 9 years later, headache was practically absent. He complained occasionally of drowsiness and insomnia. His acromegalic facial expression was somewhat improved, and the circumference of the hands diminished slightly ( $\frac{3}{8}$  inch). The left eye was the seat of optic atrophy, but vision in his right eye was sufficiently preserved after operation to permit of his attending to his usual daily duties.

Davidoff and Cushing (Arch. of Int. Med., June, 1927) assert that **insulin** will control acromegalic diabetes, but far less effectively than it does the more common forms of diabetes, the assumption being that the increased pituitary activity tends to counteract its effects. Partial **extirpation of the acromegalic adenoma** seems to render such patients more amenable to insulin and promptly

lower the tendency to hyperglycemia exhibited by many patients even in the absence of glycosuria.

**ACTINOMYCOSIS.**—Among 670 cases of actinomycosis analyzed by Sanford and Voelker, the condition occurred 42 times in *children* under 15 years of age; of these 42, only 5 were cases of primary pulmonary infection. J. C. Gittings and E. S. Thorpe (Amer. Jour. Dis. of Childr., Oct., 1926) have reported a case of pulmonary actinomycosis in a child of 5 years who had lived all his life in Philadelphia. Transmission from a pet cat which died mysteriously is suggested. Several operations were performed on the patient's chest, the last being an extensive **thoracotomy** with **opening of abscess** and evacuation of pus. The wounds were packed daily with 1:2000 **chinosol** solution, and a **nourishing diet** was given, with **potassium iodide** up to 30 grains (2 Gm.) daily. **Gentian violet**, 0.045 Gm. ( $\frac{2}{3}$  grain) in a 0.5 per cent. solution was given **intravenously**, but no favorable results followed. The patient died 4 months after admission to the hospital. In *pulmonary actinomycosis* the diagnosis can be made only by finding the organisms in the sputum or in the pus from the thoracic sinuses which usually form; these have a characteristic puckered, indurated and grayish appearance. The pus consists of necrotic tissue and cellular detritus with scarcely any leukocytes. The skin and ribs are necrotic, but not definitely invaded by the fungus.

L. G. Beinhauer (Atlantic Med. Jour., Oct., 1926) states that while **potassium iodide** is the drug of choice in actinomycosis, **copper sulphate**, 1

to 3 grains (0.06 to 0.2 Gm.) daily, is also useful and curative. Locally, **tincture of iodine**, **Lugol's solution**, or  $\frac{1}{2}$  to 2 per cent. **copper sulphate** solution as **irrigations** or **wet dressings** are very serviceable. Fractional doses of unfiltered **X-ray**, when combined with iodides, are almost specific in most cases. The writer's case, with the common involvement in the region of the lower jaw, received 4 one-quarter skin units of X-ray at weekly intervals, together with 80 grains (5 Gm.) of potassium iodide daily, and made an uneventful recovery.

In a group of 5 cases reported by P. O. Snoke (Amer. Jour. Med. Sci., Jan., 1928), the starting-points were, respectively, the jaw; chest wall and lung; vertebrae and lung; abdomen; tongue. Two, and probably 3, cases, had central nervous involvement, *viz.*, actinomycotic extradural abscess of the cord, actinomycotic brain abscess, and in the 3d case, a chronic meningitis not definitely shown to be actinomycotic. In the 5th case, with tongue involvement, the anterior portion of the left  $\frac{1}{2}$  of the tongue was excised by **surgical diathermy**. The patient also received **potassium iodide** to the limit of tolerance, small quantities of **mercury** and **atropine**, and 12 **X-ray** treatments over the neck. Apparent recovery followed.

**ACUTE RHINITIS.—ETIOLOGY.**—No completely acceptable explanation of the causation of the common cold has as yet been offered, though the consensus of opinion is that the disorder is infectious in nature. G. S. Shibley, F. M. Hanger and A. R. Dochez (Jour. of Exp. Med., Mar., 1926) have studied the normal bacterial flora of the nose and throat of 13 persons over periods of 5 to 9 months. The normal basic flora of

the nose was found to include *Staphylococcus albus*, diphtheroids, and for certain individuals *Staphylococcus aureus* and *citreus*. Occasional transient bacteria are Gram-negative cocci and non-hemolytic streptococci. In early cultures from persons with colds the writers could find no bacteria to which a causative rôle could be assigned. In colds the basic flora of the nose was often scanty in the early stages. Certain organisms were, however, prominent in colds, but usually as late or secondary invaders, including *Staphylococcus aureus*, hemolytic streptococci, and *B. influenzae*. In throat infections there was a striking incidence of hemolytic streptococci.

From reports as to the susceptibility to colds among 1431 students at Stanford University, California, W. H. Barrow (Jour. Amer. Med. Assoc., Sept. 18, 1926) concluded that the climate extremes of Massachusetts and New York as compared with the more temperate climate of California are not major factors in the susceptibility to upper respiratory tract infections. The incidence of colds was not markedly influenced by the various systems of heating used in the studies or living-rooms of the students, although the percentage of those with low susceptibility was slightly larger among those using wood or coal stoves instead of steam or other methods of heating. Whether the students used sleeping porches, well ventilated bedrooms, or poorly ventilated bedrooms for sleeping purposes did not materially affect susceptibility. Sex is apparently a greater factor in the susceptibility than any other factor considered, the morbidity rate being slightly lower for women than for men.

W. B. Blanton (Va. Med. Mthly., Mar., 1927) studied "colds" by means of a questionnaire sent to 800 individuals, comprising 429 female operators and nurses, 312 medical students, 38 inmates of an old ladies' home, and 21 children under 8 years. Of 403 female operators, 70 per cent. had had colds in the preceding year; of the 312 medical students, 95 per cent. The whole group averaged 1.7 colds during the year. There was a low incidence among the aged (1.2), and a high one among children (3.6). Colds should be divided into (1) those which are not particularly contagious and probably due to normal bacterial inhabitants of the upper respiratory tract acquiring invasive characteristics in the presence of factors lowering resistance, and (2) the very contagious respiratory infections dependent upon virulence of the causative organisms. A carrier or unisolated acute coryza in the usual contacts of the winter months infects family after family. The average duration of colds in the whole group was 6.8 days. There was a peak of incidence in September and another in January and February. The great majority of those replying (705) considered changes of temperature, including wet feet and clothes, drafts, change of weather, cold or overheated rooms, insufficient clothing, etc., to be responsible for their illness. Other causes mentioned were, contact, 60; low resistance, etc., 36; poor ventilation, 12; stomach or bowel conditions, 10; bad throat, 9, and dust, 9.

According to A. B. Jackson (Med. Jour. and Rec., Feb. 3, 1926), deficient local proteolytic ferment action to combat bacterial and non-bacterial proteins, due in turn to vasoconstric-

tion and ischemia of the nasal mucous membrane, is the cause of coryza. Volunteers were placed in the draft from an electric fan after walking rapidly 4 or 5 city blocks. During the 15-minute exposure to the fan all began sneezing and blowing their noses, and in each the nasal mucosa showed a drop in temperature of 1 to 1.5° C., with marked vasoconstriction and ischemia. Wet towels to the backs of the necks produced practically the same results. At another sitting the draft was directed over the feet and legs for about 30 minutes, when sneezing began. Upon being wrapped in blankets and allowed to walk and sit around normally, normal individuals showed disappearance of the coryza symptoms in ½ to 1 hour, while in persons with decided nasal pathologic conditions this occurred only in 12 to 24 hours. Normal individuals subjected daily to such tests developed an immunity about the 4th or 5th day, no longer showing any coryza symptoms. Those with nasal lesions, given tests every 48 hours, became refractory more slowly.

The coryza being regarded by the writer as a mild anaphylactic shock due to entrance of toxic products of incomplete protein cleavage into the sensitized cells, 3 persons were given injections of a **non-specific protein** and 3 others, of a **mixed stock vaccine**, then exposed to the draft tests already described. The first day's exposure brought symptoms from all who had received the bacterial vaccine and from only 1 who had received the protein injections. On the second day all the vaccine subjects still sneezed and showed coryza symptoms, but none of the protein subjects

did. On the third day's exposure none of either group showed any disturbance except chilling of the mucosa and ischemia.

**PROPHYLAXIS.**—Varying opinions are still entertained as to the efficacy of **vaccines** in the prevention of colds. According to F. R. Ferguson, A. F. C. Davey and W. W. C. Topley (Jour. of Hyg., Mar., 1927), available evidence suggests strongly that it is futile to hope for a reduction in the incidence of colds among the population at large by inoculation of any of the **stock vaccines** now at hand. On the other hand, follow-up data obtained by S. J. Repplier and W. G. Leaman (Jour. of Industr. Hyg., Mar., 1927) from 125 patients receiving a stock vaccine in the fall of 1925 showed 38, or 30.4 per cent., completely successful, with an additional 66, or 52.8 per cent., demonstrating markedly increased resistance for 1 year. Reaction, local or general, to the inoculations seems to be followed by a higher degree of immunity.

Blanton (*loc. cit.*) states that of 800 persons answering his questionnaire, 53 had received **vaccine**, and of these, 25, or 47 per cent., claimed to have been helped. Of 41 office patients, 30, or 73 per cent., noted from slight to great improvement from stock vaccine.

Good results from **autogenous vaccines** in various respiratory tract disorders are reported by L. Utz and A. J. Fitzgerald (Med. Jour. of Austral., Jan. 1, 1927). Of 60 private cases of recurrent colds or influenzal attacks, 31 were pronounced cured and enjoyed immunity for 12 months to 3 years; 29 were improved. The individual care and study necessary for success is not feasible in hospital out-



patient work. Each patient is a law unto himself in the acquisition of immunity, and his individual resistance must be raised by doses of vaccine dependent upon his reactions. The mode of preparation of the vaccine is very important. Swabbings are taken from the posterior nares through an aural speculum inserted in the nose, and also by means of West tubes inserted over the soft palate. Any mucopus dropping down from the posterior nares is expectorated into a sterile pot after the mouth has been washed out thoroughly. Preliminary smears are made and stained with a modification of Gram's method to demonstrate the organisms. Culture flasks are inoculated in numbers proportionate to the numbers of organisms previously seen in the films. Hemoglobin and moisture are essential for cultivation of the majority of the organisms. As subculturing weakens the vaccine it should be avoided, and more original material used where it becomes necessary to obtain sufficient organisms of any particular type. The organisms must be killed in the minimum time and at the lowest efficient temperature.

C. W. Hawley (Ill. Med. Jour., May, 1926) notes that for 35 years he has been taking a **Turkish bath** once a week to keep his skin in as good condition as possible. As a result, brisk walking, producing perspiration, and standing or sitting in a draft will not cause him to take cold.

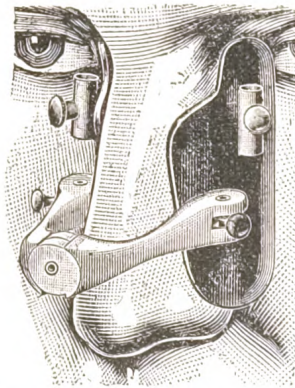
**TREATMENT.**—According to Sternberg (Wien. klin. Woch., Sept. 1, 1927), a few drops of 10 per cent. **tincture of iodine** or 3 to 5 drops of an **iodine-potassium iodide** or **iodine-sodium iodide** solution in a glassful of water will often check a cold in a few hours to a day. In nervous cold

(*hydrorrhea*) a favorable effect follows **subcutaneous injection** of 5 per cent. **sodium iodide** solution, which embodies traces of nascent free iodine. In subacute colds such injections are given at intervals of 1 to 4 days, up to a total of 6 injections. Patients not responding to this receive dry **peptone** for 2 weeks; then the iodine injections are started again.

That acute coryza starts as a vasomotor rhinitis due to a "shock" effect of cold, inducing an upset of physico-chemical molecular equilibrium together with altered capillary circulation, disturbed secretion of the bactericidal nasal mucus, and the production of conditions favorable to the penetration of germs, is maintained by J. Tarneaud (Paris méd., Sept. 4, 1926). A local "shock" effect may also be exerted by dust, powders, fumes and injudicious local medication. Coryza is, of course, frequently infectious, but it is a nasal neurovascular disturbance due to "shock" which allows the infectious factor to come into play. This factor induces, in turn, further vasomotor disturbance and vasodilatation.

Local antisepsis has never proven prophylactic or abortive of coryza. Prophylaxis consists of hardening against cold, especially by **cold hydrotherapy**, correction of local pathologic states such as deviated septum, and the use of the **galvanocautery**, an old-fashioned but undoubtedly effective measure. In incipient actual coryza, Tarneaud has not found either local antiseptic treatment, cauterization or bacterial filtrates of value. Cocaine and adrenalin locally are harmful. General treatment, on the other hand, gives appreciable success in incipient coryza. Godlewsky has recorded

good results from aconite. The old-fashioned measures, heat in various forms, mustard foot-baths, and hot drinks, are not without value, acting on the vasomotor disturbance. **Acetylsalicylic acid** has sometimes proven successful. The best abortive effects in coryza are obtained, however, by influencing the vegetative nervous system. **Belladonna** is of value, though its dosage is difficult to specify, since it depends on the state of the individual's vegetative system. **Adrenalin** by the mouth will frequently



Bipolar nasal electrode for diathermy in coryza. (Bordier, in *Paris med.*)

abort an incipient cold. As soon as the nasal congestion begins to be felt, 10 drops of a fresh 1:1000 solution should be taken, between meals, in a little water, and repeated 3 hours later, and once again after a like interval, if required. In successful cases the feeling of nasal heat and pricking sensation in the nasal cavities disappears often in 2 hours after the first dose.

According to Blanton (*loc. cit.*), there is little question about the efficacy of **rest in bed, warmth, fluids and alkalies** in restoring and augmenting immunity. **Shrinkage** of the nasal mucosa and **suction** effectively promote drainage of the paranasal sinuses.

Local applications of **silver preparations, mercurochrome**, etc., are well known procedures, but there are grave objections to swabbing and spraying. The claims for **chlorine inhalations** are unconfirmed in the recent literature. According to Cecil, the chlorine treatment is expensive and impractical, and the results are in no way commensurate with the objections to its use.

As a radical cure for acute coryza H. Bordier (*Paris méd.*, June 11, 1927) recommends **diathermy**. As originally applied by Tsinoukas, of Athens, Greece, the method consisted of placing 2 large No. 26 Hegar bougies on either side of the nose as electrodes; even with a weak current of 200 to 300 milliamperes, coryza is cured in 20 minutes. The writer has used instead 2 spoon-shaped electrodes, and more lately a specially constructed bivalve bipolar electrode consisting of 2 metal plates measuring 50 x 20 x 1 mm. and fastened to the limbs of a hinged V of insulating material. Light, flexible wires conduct the current to these limbs, and the device is held in place by a rubber tape passing around the head. The current is increased until the patient notices intranasal warmth. Later, recovery from the coryza occurs when he complains that the current is harder to tolerate, the local fluids having been partly dried up. After the treatment, free nasal breathing is found restored, sensitiveness of the mucosa gone, and sneezing and secretion checked. In most cases a single treatment suffices, but the results are more complete with 2 or 3 treatments. The more acute and early the coryza, the more rapid the cure.

The dangers of a common cold in the *newborn infant* are stressed by H.



T. Price (Atlantic Med. Jour., Feb., 1926). It rapidly extends through the respiratory tract, and pneumonia may develop quickly while the primary infection is overlooked. In the treatment, constant attention is the keynote. **Adrenalin chloride** solution, 1:4000, 1 drop in each nostril hourly, should be used until effective in opening the nasal passages. **Atropine** is valuable in  $\frac{1}{1000}$  grain (0.00006 Gm.) doses hourly until full physiologic effect is obtained, then every 3 hours. A **mustard bath** should be used in case of respiratory failure, to be repeated at short intervals when indicated. **Oxygen** should be used freely during the danger period. **Artificial respiration** has saved life. Often the danger period is past in 48 hours. The room temperature should be kept at 80° F. (26.6° C.). **Liquids** should be given as freely as possible, but the struggling child will usually refuse them by mouth, in which case **normal salt solution** may be administered by the bowel every 4 hours in 2- or 3-ounce (60 to 90 c.c.) doses and held by pressure on the buttocks, if necessary.

**ADDISON'S DISEASE.**—When a case is clinically one of this disease but at autopsy shows no lesions of the adrenals, it is usually assumed that there was destruction or impaired function of the chromaffin system outside of the suprarenal glands. In the opinion of E. G. Wakefield and E. E. Smith (Amer. Jour. Med. Sci., Sept., 1927), such a diagnosis is correct, since Addison described a clinical and not a definite pathologic concept. Differentiation between Addison's disease and *toxic suprarenalopathy* can be effected only through the lapse of

time, the patient soon recovering from the latter condition. In late years many observations have illustrated the possibility of temporary impairment of suprarenal function. A case reported by the writers shows how closely the Addisonian syndrome may be simulated. A man had had an infection suggesting influenza. Two weeks later he was admitted to a hospital with dizziness, pain in the back and right side, weakness, nausea and vomiting; blood-pressure, systolic, 80; diastolic, 48. The skin was dry and dark, but not abnormally pigmented. Upon rest in bed, with a high caloric diet, the symptoms ceased, the pressure rose to 106 and 70, and the patient was discharged and went about his work. This was regarded as an instance of toxic or inflammatory suprarenalopathy due to an apparently influenzal infection.

According to E. Bonilla and A. Moya (Med. Ibero, Aug. 20, 1927), the *blood sedimentation time* affords the most dependable laboratory evidence for a diagnosis of adrenal impairment. The sedimentation time was found decreased in 24 cases.

In a study of the *acid-base equilibrium* in 6 cases of Addison's disease, G. Marañón and J. Morros Sardá (Siglo méd., Aug. 27, 1927) found a distinct reduction of the alkali reserve in 4, and in the other 2 there was tendency to reduced alkalinity. The degree of acidosis appeared to parallel the intensity of the disease. **Alkaline treatment** may be used in cases with acidosis. If insulin is given, an ample amount of sugar should be added, great sensitiveness to the former agent existing in these cases. E. F. Chapman (Brit. Med. Jour., Feb. 20, 1926), establishing the blood sugar curve in a case of Addison's disease, found it remarkably flat, in harmony with an increased glucose tolerance.

M. Loeper, J. Decourt and J. Ollivier (Bull. Soc. méd. des hôp. de Paris, Feb. 25, 1926) state that the nervous theory of the Addisonian *melanoder-mia* has been losing ground. The pigmentation depends directly upon the impaired adrenal function or the metabolic disturbances resulting from it. In one case, merely a fatty change in the adrenals, without inflammation or apparent nervous lesion, was attended with melanoder-mia. The melanin responsible for the pigmentation is rich in sulphur (up to 9 per cent.). Whereas normally the sulphur in the blood-stream hardly exceeds 0.1 in 1000, in 2 cases of Addison's disease the writers found 0.17 and 0.23. Further, the neutral sulphur was found to make up 40 to 50 per cent. of the whole, as against 20 per cent. normally; this betokens a notable disturbance of sulphur oxidation in Addison's disease. Findings in adrenalectomized dogs confirmed these observations. The adrenals evidently play a considerable rôle in sulphur metabolism. Tests of the suprarenal arterial and venous blood showed that these organs fix sulphur. The adrenal pigment, again, was found to contain sulphur. It is difficult to avoid the conclusion that the thiopexic (sulphur-fixing) function of the adrenals is connected with the changes in the blood sulphur in lesions of these organs and after adrenalectomy. The increase of blood sulphur coexists with the skin pigmentation and probably plays a rôle in its production.

**TREATMENT.**—The **Muirhead régime** in Addison's disease is recommended by L. G. Rowntree (Jour. Amer. Med. Assoc., Jan. 31, 1925). It consists of the frequent administration of **epinephrin (adrenalin)** hypo-

dermically and by rectum, and of **whole suprarenal or suprarenal cortex** by mouth to the point of tolerance. The latter varies widely in different cases, and even from time to time in the same case.

During the advanced stage and especially during shock, **rest in bed** should be absolute, and **artificial heat** is indicated. In stronger patients, moderate **exercise, fresh air and sunshine** are desirable. The **diet** should be rich in carbohydrates, with feedings at regular and frequent intervals. **Fruit juices** and **milk** are given between meals, and during the night one serving of milk or fruit juice. A small dose of **epinephrin** is given by **proctoclysis** during the early morning hours to patients extremely ill. The breakfasts should be simple and easily digestible. Acidosis is commonly associated with shock and is best controlled with **sodium bicarbonate**. In continuous nausea and vomiting, withdrawal of all food by mouth for 24 hours, and moderate doses of **codeine** and **chloral** may be effective. **Glucose intravenously** has been used repeatedly in such crises (up to 600 c.c. of a 10 per cent. solution, given slowly). **Digitalis** and **nux vomica** are used in periods of profound cardiac weakness. During collapse, **black coffee** is often of value.

Patients in the earlier stages, as a rule, tolerate 5 to 10 minims (0.3 to 0.6 c.c.) or even 15 minims (0.9 c.c.) of **epinephrin** 3 times a day hypodermically; 5 to 10 minims rectally, and 5 to 10 grains (0.3 to 0.65 Gm.) of **whole gland or cortex** by mouth 3 times a day, best given after meals. The cortex is more satisfactory and apparently as effective as the whole



gland. In patients in a very critical condition when first seen, it may be well to start the drugs in small doses, and increase gradually.

Strychnine and arsenic in Addison's disease are warned against by L. Ramond (Jour. des prat., July 31, 1926). **Pituitary extract** may be given along with the suprarenal therapy. The frequent digestive disorders should be treated by **diet**, and in addition, a powder consisting of 95 parts of **prepared chalk** to 5 parts of **sodium phosphate** given in teaspoonful doses in water, twice daily.

Treatment by **ephedrin** has been tried by Rowntree and G. E. Brown (Endocrinol., May-June, 1926). The daily dosage ranged from 0.05 to 0.25 Gm. ( $\frac{3}{4}$  to 4 grains). While increase in blood-pressure and in metabolic rate as a result of the drug could be demonstrated, there were rarely any significant subjective or objective evidences of clinical improvement. In 1 early case, weakness and exhaustion disappeared and the patient felt buoyant, strong and refreshed, as is common under the Muirhead regimen. These results, however, were not reproduced in several other early cases.

**ADENITIS.—SYMPTOMS AND DIAGNOSIS.**—The term *hilum tuberculosis* was adopted in 1925 by the American Sanatorium Association to designate, as specified by H. D. Chadwick, the children whose tuberculosis is as yet confined to the lymphoid tissues about the trachea, right and left bronchus, and the larger bronchial subdivisions. R. Clifford (Boston Med. and Surg. Jour., Sept. 16, 1926) points out that the diagnosis of this condition should be made guardedly. Frequent examinations and observa-

tions of the child over long periods of time are often required. Before making such a diagnosis, the following conditions must be present: (1) Definite history of exposure; (2) positive tuberculin test; (3) definite constitutional signs and symptoms denoting tuberculous toxemia, chiefly fatigue, malnutrition, underweight, lassitude and nervous irritability; (4) X-ray evidence of enlarged hilum glands; (5) physical signs indicating bronchial gland enlargement. Of these, the most important are the constitutional signs and symptoms. A history of pertussis, measles, pneumonia, influenza, etc., is important from the possibility of these conditions lighting up an old latent tuberculosis to activity. A history of enlarged neck glands or phlyctenular keratitis is of significance. Cough and sputum are not very common findings. Good home conditions with real underweight or failure to gain are significant. Fever, if present, is usually intermittent, in the afternoon, and after exercise. Generally, however, the temperature is normal, and slight afternoon fever should first lead to a search for some hidden non-tuberculous focus of infection.

Enlarged cervical, axillary, inguinal and mediastinal glands should be searched for. Percussion of the parasternal dulness is useful mainly for ruling out enlarged thymus, cardiac enlargement or substernal thyroid. Percussion of the spinal column may reveal a marked spinal dulness indicating some mediastinal condition causing pressure. Auscultation is of importance mainly in that an enlarged bronchial gland may, by pressure, cause chronic lung infections with râles and change of breath

sounds at the bases. Also, in ausculting over the back of the bifurcation of the bronchi, a prolonged expiratory note should be considered suspicious of an underlying enlarged gland pressing on the bronchus. The X-ray will exclude any parenchymatous infiltration and other causes of similar symptoms and signs. It also reveals enlarged bronchial glands, but does not show whether they are tuberculous, unless calcification is present.

In a study of the relative value of symptoms, signs, etc., in the diagnosis of hilum tuberculosis, D. Zacks (Jour. Amer. Med. Assoc., Feb. 27, 1926) compared a reactor group of 1176 school children (positive Pirquet) with non-reactor (negative Pirquet) group of 1109. Most of the symptoms were found of relatively little diagnostic utility when taken singly. The diagnosis should be based on a conservative evaluation of certain symptoms (underweight for age and height being most important), signs (relative interscapular dulness), exclusion of other diseases, and control by X-ray and tuberculin test. By this method, 459 cases out of 10,648, or 5 per cent., were diagnosed hilum tuberculosis. Of the 10,648 children between 6 and 15 years, 29.2 per cent. reacted to the tuberculin test. In a "hilum" group, interscapular dulness was found in 74 per cent.; in a "suspicious" group, 51 per cent., and in a negative group, 27.7 per cent.

That tuberculous tracheobronchial adenopathy in *adults* is practically nonexistent is emphasized by P. Ameuille and E. Maldan (Bull. Soc. méd. des hôp. de Paris, July 22, 1926). Even in deep and extensive pulmonary tuberculous lesions in adults these glands fail to react, whereas in children enor-

mous caseous adenopathies are found even with very slight lung disease. Too often X-ray reports speak of gland enlargements at the hilum in adults, whereas even actual adenopathies do not always yield radiologic evidence. There is as yet no satisfactory explanation as to why the glands fail to react in adult tuberculosis. That they can react to other infections in adults is readily seen in autopsies of pneumonia cases in the aged.

Enlarged tuberculous tracheobronchial glands in children may *simulate asthma*, according to M. M. Peshkin and A. H. Fineman (Jour. Amer. Med. Assoc., May 8, 1926). These cases being very contagious (Schick), it is important to differentiate them early from true asthma. Wheezing begins in the first year of life and continues without remission. There may be a low grade fever, vomiting and perspiration, which may continue for a year or more. Respiratory distress is greater than in the average asthmatic child, with expiratory dyspnea and numerous rhonchi and loud râles. The breath sounds are usually diminished on one side, where there may be a hyperresonant note suggestive of unilateral emphysema; this finding is of diagnostic importance. The spleen and liver are often enlarged. Epinephrin hypodermically fails to relieve. A positive tuberculin reaction in an infant or child of 1 to 2 years with a persistent wheeze is very significant. The X-ray confirms the diagnosis, showing wide irregular shadows at the hilum.

S. Davidovitch (Presse méd., Sept. 11, 1926) notes that *tuberculous mesenteric glands* generally become transformed into caseous pockets, which may readily perforate. The advent of suppuration has a marked effect on

neighboring tissues, with resulting pain and other evidences which may closely simulate appendicitis, duodenal ulcer or cholecystitis. A characteristic feature, however, is the occurrence of periodic attacks of pain, continued pain being very uncommon.

The utility of the *X-ray* in the diagnosis of tuberculosis of the abdominal lymph-nodes in children is emphasized by E. C. Dunham and A. M. Smythe (Amer. Jour. Dis. of Childr., June, 1926). While very common, the condition has in the past been rarely diagnosed except at operation or necropsy. Of 120 children with positive tuberculin tests, 21, or 17 per cent., showed calcified lymph-nodes by *X-ray*. The shadows are of characteristic shape (oval, rounded, or crescentic) and appearance (white, and more intense than bone shadows). In the lateral view they lie anterior to the vertebral column. They persist in repeated plates and after intestinal evacuation. The demonstration of calcified nodes in the abdomen is of value in establishing the locus of a tuberculous lesion and in helping to differentiate it from other conditions such as appendicitis, sarcoma of the kidney, renal tuberculosis or stone in the kidney.

That *dental infection* may cause extensive disease of the lymphatic glands was the conclusion reached in a case reported by O. T. Osborne (Med. Jour. and Rec., Nov. 17, 1926). A woman aged 56 had enlarged glands in both axillæ. A gland a little larger than a plum, surgically removed 2 weeks after it appeared, was variously diagnosed as Hodgkin's disease and lymphosarcoma. There were also several enlarged glands in the neck. The upper right lateral tooth

showed infection at the apex, was **extracted**, and yielded cultures of *Staphylococcus aureus* and *Streptococcus non-hemolyticus*. She was put on a liberal **protein diet** and given **red bone marrow** and **spleen tablets**, a moderate anemia and relative lymphocytosis having been found. Five days after the dental extraction the gland in the right axilla had all but disappeared, and under added use of **thyroid**, 1 grain (0.06 Gm.) a day, and **tonics**, including **iron**, the glands all subsided in about 18 months, including one on the right side of the neck which had been enlarged for many years.

**TREATMENT.**—Although, according to C. B. Gibson (Amer. Rev. of Tuberc., June, 1926), the **X-ray** treatment of tuberculous adenitis has not yet been established on a sufficiently definite basis to warrant conclusions, several observers have reported favorably on it of late. Thus, Amundsen (Norsk. Mag. f. Laeg., Feb., 1926) reports 81 per cent. cured out of 32 cases of simple tuberculous adenitis, 49 per cent. cured out of 32 cases with added periadenitis, and 77.4 per cent. cured out of 53 cases with suppuration and sinuses. All these patients were re-examined 2 to 9 years after the treatment, and only 4 per cent. showed recurrence.

H. Markus (Deut. Zeit. f. Chir., Sept., 1927) records 320 cases of *cervical gland* tuberculosis, with cure in 93.9 per cent. Small doses, filtered through 0.5 mm. of zinc, are recommended, and only small fields should be exposed. A course of treatment consists of 9 exposures at intervals of 2 weeks. At least 3 months should elapse before further treatment, if needed, is carried out. These pre-

cautions are necessary since late X-ray injuries may occur from excessive dosage or inadequate intervals. Such injuries comprise depression of the submaxillary skin surface, which is pale, hard and adherent; arrest of hair growth; sometimes telangiectases, pigmentations and hyperkeratosis; rarely, such conditions as aphonia, recurrent nerve or spinal accessory paralysis, dental caries, and impaired parotid function.

**Radium** treatment has also been favorably reported on. Of 25 cases of tuberculous adenitis thus treated by G. A. Robinson (N. Y. State Jour. of Med., July 1, 1927), 18, or 72 per cent., became clinically well; 5 were improved, and 2 died—1 of pulmonary tuberculosis and the other of influenza 5 years after the neck had healed. Radium constitutes a safe procedure, if properly used. Unless sinuses were present, no scars are left. Radium produces an inflammatory reaction which hastens healing of sinuses and causes a gradual shrinkage of the tuberculous lymph-nodes; many of the latter entirely disappear, while others remain as fibrous nodules. The nodes to be treated are carefully palpated, and areas mapped out on the overlying skin. **Incision** or **aspiration** of the pus and caseating material is indicated before radiation. A large, firm mass requires more radiation and deeper penetration than soft, superficial nodes. Usually 100 mgm. of radium element in 3 or 4 brass tubes strapped to a block of wood 5 x 7.5 x 3 cm. and applied for 15 hours will cause rapid regression of the nodes. The gamma rays are employed, and each square centimeter of skin surface receives 40 mgm.-hours at 3 cm. distance, *i.e.*, about  $\frac{1}{2}$  erythema dose.

Treatments are repeated monthly; as a rule, 5 or 6 are necessary.

P. Gosse (Lancet, Apr. 24, 1926), in applying **radium**, uses plates covered with 2.5 mgm. of radium element per square centimeter of skin surface, with a shield of Monel metal 0.3 mm. thick. He reports, out of 50 cases, cure in 37, improvement in 9, no improvement in 3, and death in 1.

**Aspiration** is advocated by G. W. Haigh (Boston Med. and Surg. Jour., Jan. 27, 1927) in adenitis—not infrequently facilitating the diagnosis and also occasionally constituting effective treatment. In a child of 10 with a solitary enlarged gland of 2 weeks' duration behind the angle of the jaw, firm and tender, non-fluctuant, and movable, the hypodermic needle drained out 4 c.c. of pus, whereupon inflammation disappeared and cure promptly followed. In a case of enlarged axillary gland due to persistently sore nipples in a woman of 42, exploratory puncture revealed pus, and aspiration, repeated 5 days later, afforded complete relief.

According to Gibson (*loc. cit.*), **heliotherapy** will undoubtedly promote more cures of tuberculous adenitis than would ordinarily be anticipated by other means. The Calot method of aspiration and injection is highly successful when combined with general heliotherapy, but whether it is any more successful than simple aspiration with heliotherapy is doubtful.

In 4 cases of gland tuberculosis with sinus formation and elongated local elevations of the skin resembling keloids, Delcroix (Bull. Soc. des sci. méd. et biol. de Montpellier, Mar., 1927) had excellent results with what he terms the **actino-marine treatment**. A translucent cotton ribbon is placed over the diseased area, saturated with



sea water, and the therapeutic lamp then brought into action over it. The water is added constantly, drop by drop, over the cotton to keep it wet. Rapid improvement and healing were thus obtained where general treatment at the seashore or the ultraviolet rays used generally and locally had failed to influence the condition. The keloid appearance was dispelled and linear scars secured.

In 14 cases of tuberculous adenitis treated by A. von Bonsdorff (Tubercle, Oct., 1926) by radiation with **therapeutic lamps**, a more or less complete reduction of the glands was effected. Sinuses and ulcers, when present, were healed. The general health was improved and the patients gained weight.

**Surgical treatment** of tuberculous glands of the neck is favored by Clute (Ann. of Surg., Nov., 1927) on the basis of 131 cases. The end-results were studied. There was no mortality. The best results were in early cases, the scar being less noticeable because extensive resection was not necessary and complete excision was possible. Recurrence is rare if operation is carried out before sinuses and abscesses appear. In certain cases, combination of **X-ray** and surgery gives excellent results. For the average patient, who cannot afford prolonged hygienic treatment, surgery seems the method of choice. **Removal of all sources of infection** is important, as failure to do so may greatly delay recovery. The incidence of nerve lesions within the last 5 years, since marked attention has been given to this possibility, has greatly diminished, only 1 case occurring in the series discussed. On the other hand, according to Gibson (*loc. cit.*), surgery, in competent hands, is appli-

cable to a *small* percentage of cases, after non-surgical procedures have failed, and where removal of the lymph-nodes is of greater importance than the possible development of paralysis.

In 5 cases of *inguinal adenopathy* (poradenitis), P. Delbet (Bull. de l'Acad. de méd., Apr. 5, 1927) has had surprising results from a form of **autotherapy** in which a portion of the glandular mass or masses is excised, desiccated, pounded into a pulp, sterilized, and reinjected in ascending dosage. An illustrative case was that of a youth who developed adenopathy in the right groin 5 or 6 days after a suspicious coitus. The glands became confluent and formed a mass larger than a hen's egg. Over the apex of the mass the skin was purplish and attenuated, and fluctuation could be felt. In the iliac fossa another glandular mass of equal size was palpable. The inguinal mass was thereupon surgically removed, divided into small pieces, dried over calcium chloride in the incubator for 48 hours, the dried pieces ground up with salt solution, and 40 c.c. of a yellowish purée collected and divided among 5 tubes in ascending doses of 1 to 12 c.c. The tubes were heated twice to 60° C. (140° F.). Upon subcutaneous injection of the 5 doses on alternate days, the iliac glands proceeded to melt away at an astounding rate, disappearing completely in 11 days after the first injection (3 days after the last injection). The injections caused no appreciable local inflammatory reaction.

In *tracheobronchial adenopathy* in young children with cough and an asthmatoïd condition, Escardó (Arch. Lat.-Amer. de Ped., Feb., 1926) has found **X-ray** exposure of the hilum very helpful. A dose of 5 H units with a 1 mm. aluminum filter was used. In some instances there was not only symptomatic improvement, but the adenopathy subsided.

**ADENOIDS.**—The indications for operation in adenoids are summed up by W. Sangster (Med. Jour. of Austral., Nov. 6, 1926) thus: (1) Mouth breathing day or night. It may be only at night, with noisy and restless sleep, perhaps noticeable only when a cold is present. (2) Chronic mucopurulent catarrh. (3) Frequent colds. (4) Spasmodic cough, due to the irritation of the unmoistened and unwarmed air in the pharynx or by mucus dropping in the throat. (5) Enlarged cervical glands in the posterior triangle. There is no definite age for the operation; any age when symptoms exist is the best age, even in infants a few months old. Best results from the operation are obtained if it is done before the second dentition; after 7 or 8 years they are less pronounced.

Among 1416 tonsil and adenoid operations performed in the Royal Victoria Hospital, Montreal, in 1926, as noted by W. J. McNally (Can. Med. Assoc. Jour., June, 1927), post-operative *hemorrhage* occurred from the adenoid bed in 6 cases, or 0.4 per cent. The operative procedure consisted in first employing the Laforce adenotome and following with adenoid curettes. In severe bleeding from the tonsillar or adenoid beds the condition can be dealt with most efficiently and safely in the operating-room, under general anesthesia. Of the 6 cases of adenoid bleeding, 2 required **post-nasal packing**. The plug should never be left in more than 24 hours and preferably not over 18 hours. The other 4 cases yielded to the more conservative method of removing large clots from the nasopharynx, *viz.*, keeping the patient **quiet**, placing **ice compresses over the nose**, and instil-

ling **hydrogen peroxide** and **adrenalin**. All of the 6 cases of adenoid bleeding were cases of definite secondary hemorrhage, *i.e.*, delayed until the 3d to the 10th day after operation.

The respiratory factor in the **post-operative treatment** of tonsil and adenoid cases is emphasized by J. D. Lickley (Practitioner, May, 1926). Dividing the cases into a predominantly obstructive and a predominantly toxic type, he notes that in the former type restoration of normal respiratory efficiency after operation is usually rapid. It is in the toxic type, however, that the most striking respiratory alterations exist before operation: The upper part of the chest in front is narrow and flattened and looks sunken, with the shoulders drooping and rolled forward so that the scapulæ stick out behind; slight kyphosis may exist. The abdomen is prominent and somewhat pendulous, and this is associated with some degree of lordosis. There is an almost specific flabbiness of the abdominal muscles and diaphragm, with dropping of the abdominal viscera and reduced height of the diaphragmatic dome, impairing the mechanical efficiency of this muscle. The resulting defective ventilation is particularly liable to affect the apices, posterior borders and hila.

After operation, treatment of the respiratory muscular disability is very necessary and helpful. Sometimes mere **rest in bed** for a few days yields marked benefit. Combined with **general physical exercises**, there should be special **exercises to restore** normal position and action of the **respiratory apparatus**. These special exercises the writer specifies thus: (1) The vertebral part of the dia-

phragm should be exercised, and with it combined some exercises for strengthening the abdominal muscles, to be performed at first with the child in the supine position. (2) Next these are practised in the erect posture, and the costal part of the diaphragm then exercised. (3) The general stance is to be corrected. Such after-treatment, insuring efficient distribution of air to all the pulmonary alveoli, will minimize recurrence of adenoids and lessen the chances of chronic nasal and bronchial catarrhs, often met with in adults with faulty respiration.

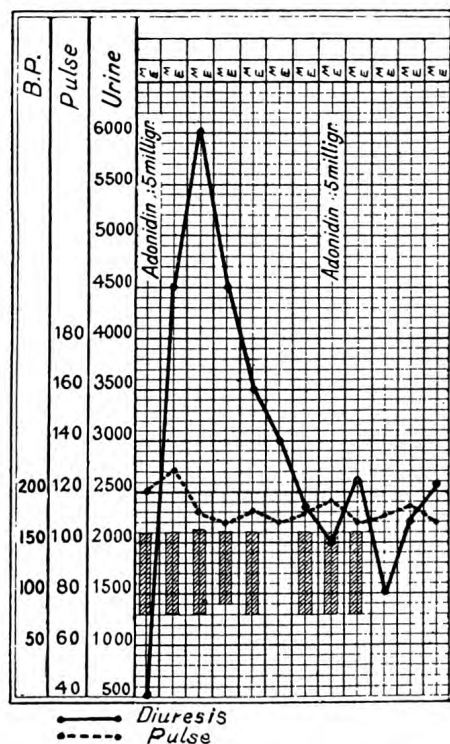
**ADIPOSI DOLOROSA.**—In 1 of the 2 cases reported by F. S. Hone (Med. Jour. of Austral., May 1, 1926), the chief complaint was a dragging pain in the upper part of the abdomen on the left side. The patient, a woman of 65, had painful fat deposits round the hips, on the insides of the thighs and knees, and down the legs. There was also a pendulous tender fold of fat across the lower abdomen, and an excess of fat behind the upper part of the arms. There was scaliness of the skin of the legs; the skin of the abdomen and arms was dry, and the hair was dry and had fallen out slightly. The dryness and scaliness had been present since childhood, but the fatty deposits had developed mainly since the menopause at 48 years. The basal metabolism was —20, and sugar tolerance increased. Thyroid, pituitary and gonad insufficiency were thus suggested, but the skull X-ray showed a normal sella. Under thyroid treatment she lost 2 pounds weekly; the skin gradually lost its scaliness and fatty deposits became much softer. Abdominal pain recurred frequently, however, and an

exploratory laparotomy was performed, revealing merely that the omentum was heavily loaded with fat. Under further thyroid therapy the patient felt greatly improved, and had lost altogether 20 pounds. The second case was the patient's sister, aged 69, who had much more severe pain in her fat deposits, which had begun after cessation of childbearing at 31 years and been already quite definite at 40.

In a case recorded by N. C. Foot, R. W. Good and M. C. Ménard (Amer. Jour. of Path., May, 1926), the pituitary appeared to be at fault, as in most cases that have come to necropsy. There was also sclerosis of the thyroid and persistent thymus, which, in a patient of 60, might be ascribed to overstimulation of the pituitary.

**ADONIS VERNALIS.**—P. Harvier and A. Schedrovitsky (Bull. Soc. méd. des hôp. de Paris, June 3, 1926) have found that **adonidin** may readily be used by *intravenous injection* in a 0.5 per cent. aqueous solution. In patients with sclerotic **cardio-vascular renal disease** and cardiac insufficiency, in the presence of **anasarca**, it induces a strong, prompt and prolonged diuretic effect. Its action as a heart- tonic is less manifest. Intravenous injection of it can be practised in these cases without preliminary purgation or evacuation of serous transudates. The necessary and sufficient dose for intravenous use is 0.005 Gm. ( $\frac{1}{13}$  grain). While the drug is devoid of cumulative action, repeated injections for the production of diuresis are not required. Intravenous use of adonidin may be availed of in **cardiac insufficiency** where, after a course of digitalis, diuresis is slow in setting in, or where digitalis is contraindicated. High blood-pressure does not seem to contraindicate the use of adonidin. Nor did the drug appreciably slow the heart-rate or regulate the rhythm in the old, sclerotic patients in whom the writers used it, in

spite of its very prompt diuretic effect. Its use leaves the heart sensitive to the other heart-tonics, such as digitalis and ouabain. The only contraindication to adonidin is the terminal stage of cardiac insufficiency



Diuresis following intravenous injection of adonidin in a case of cardiovascular renal disease with cardiac insufficiency (Harvier and Schedrovitsky).

with marked dilatation of the organ and irreducible edema, in which intravenous injections of other drugs would likewise be dangerous.

### ADRENALIN (EPINEPHRIN).

—**PHYSIOLOGIC ACTION.**—C. J. Wiggers (Jour. of Pharm. and Exp. Therap., Jan., 1927) has reported experimental work affording further knowledge as to the exact manner in which *circulatory action*, and in particular that of the heart, is influenced by epinephrin. It had already been shown that the systolic discharge of the heart and the pulse-pressure are increased by this drug. The greater systolic discharge is brought about *entirely* by a greater velocity of discharge and in spite

of the fact that the actual period of ejection is reduced much below the normal. This occurs whether the heart is slowed or accelerated. While epinephrin can produce its typical stimulating action on the heart independently of changes in peripheral resistance, the effect is considerably enhanced by the augmented resistance from contraction of the arteries. The pressure within the ventricles is reduced far below the normal level at the very beginning of diastolic inflow, in consequence of a direct and specific effect of epinephrin on ventricular relaxation. In the case of the right ventricle, the drug increases all the influences which enhance ventricular filling. Thus, the right auricular pressure is increased, the filling influence of auricular systole is augmented, and the interval of filling is prolonged on account of the abbreviated systole and more rapid decline of pressure. In the case of the left ventricle, all of these factors also operate with the exception of the left auricular pressure, which falls. Epinephrin sometimes increases and sometimes decreases the velocity of auriculoventricular conduction to a slight extent. There is some evidence that this may be associated with opposing cardiac and central vagus effects.

The cardiac output of normal unanesthetized dogs was found increased 10 to 59 per cent. by epinephrin given both intravenously and subcutaneously by C. Pilcher, C. P. Wilson and T. R. Harrison (Amer. Heart Jour., Aug., 1927). The duration of the effect was less than 7 minutes after intravenous and very variable after subcutaneous administration. One dog showed a decrease in cardiac output on 3 occasions after epinephrin.

T. Sollmann and O. W. Barlow (Jour. of Pharm. and Exp. Therap., Oct., 1926) state that the response of the *frog heart* to epinephrin appears to be the resultant of two opposed actions: (1) Stimulation of the accelerator receptive mechanism; (2) depression and injury of the cardiac muscle. Both actions increase with the concentration of epinephrin; but the depressant action predominates with concentrations below 1:100,000,000, and begins with dilutions as high as 1:1,000,000,000,000. With solutions stronger than that first mentioned, the accelerator stimulation pre-



dominates markedly at first, but soon merges into injurious depression. The depressant effects are not antagonized by atropine or ergotoxine, but may sometimes be overcome by additional accelerator stimulation.

Studying the influence of intravenous injections of epinephrin on the heart of young healthy human subjects, Petzetakis (Presse méd., Jan. 2, 1926) found that it first stimulated the sympathetic nerves and intracardiac centers, then the parasympathetic. The second phase appears to be much longer than the first. When the adrenalin is preceded by atropine, the changes in heart conduction and contractions characteristic of the second phase fail to develop. Upon intravenous injection of 1 c.c. (16 minims) of solutions of 1:50,000 to 1:30,000 strength of adrenalin, the blood-pressure rises, while with solutions of 1:15,000 or stronger, the rise of blood-pressure is followed by a fall. Intracardiac injection of adrenalin in collapse under anesthesia should be used with especial caution in the case of chloroform, as the revival of heart action under it may be followed by fibrillation and permanent cardiac arrest, due to increase by the adrenalin of the irritation of the parasympathetic already induced by the chloroform. For intracardiac injection in general, the writer advocates not exceeding 0.00025 Gm. of adrenalin (4 minims of the 1:1000 solution) at the first dose; this amount may be repeated, or the second dose made twice as large.

Studying the action of adrenalin on the cerebral vessels, Miwa, Ozaki and Shiroshta (Arch. f. exp. Path. u. Pharm., July, 1927) found these vessels constricted by it only when the blood-pressure was kept constant; otherwise, an increase of cerebral circulation was produced.

As regards the intestine, W. J. R. Heinekamp (Jour. of Lab. and Clin. Med., Aug., 1926) notes that, in general, the work to date indicates (1) that adrenalin ordinarily relaxes the gastrointestinal canal with the exception of the sphincters, which are contracted, and (2) that in very minute quantities it causes contraction of the gut. The latter effect is most generally explained by stating that the drug stimulates the motor sympathetics, whereas the inhibition is produced by stimulation of inhibitory sympa-

thetics, the action in either case being on the myoneural junctions. With the first part of this explanation the writer disagrees. The increased intestinal activity with small doses is not due to stimulation of the motor sympathetics, nor to direct changes in the muscle, since it is increased after eserine (synergy) and is totally prevented by atropine. His observations and experiments lead to the conclusion that the increased activity is due to stimulation of the peripheral parasympathetic (vagus) apparatus.

In many instances of apparent hyperglycemia, according to Friend (*ibid.*, July, 1926), adrenalin in the blood, and not sugar, is being estimated. He found adrenalin in both normal and pathologic blood sugars.

According to the experiments of C. I. Krantz and J. H. Means (Jour. of Clin. Invest., June, 1927), obese subjects have more fat and less glycogen available for metabolism. When a metabolic stimulant, such as epinephrin, is administered, the most readily available food-stuff is oxidized; in the obese, this available food is fat.

**ABSORPTION.**—Several studies on the absorption of adrenalin when taken by the mouth have recently been published. Experiments in dogs by A. T. Maxenchs (Ars med., Jan., 1927) indicated that adrenalin given orally produces a transient increase in the blood sugar, this increase being proportional to the dose. Orally, 5 to 10 times as much of the drug is required as when it is injected. It should preferably be given on the empty stomach. Its toxicity is slight on oral use. Similarly, Brems (Acta med. scandin., May 27, 1926), giving 8 c.c. (2 drams) of 1:2000 adrenalin solution by the mouth in human subjects, observed a hyperglycemia reaching its height in about 1 hour. Frequently epigastric pains attended such medication. The blood-pressure was increased in 5 cases; unaffected in 7, and lowered in 9.

According to W. C. Menninger (Arch. of Int. Med., Nov., 1927), oral administration of epinephrin is inconstant and unreliable, but, despite the generally expressed opinion to the contrary, it is absorbed in the gastrointestinal tract (other than the mouth and throat) in certain cases, as evidenced by changes in blood-pressure, increased tremor, sweating, abdominal dis-

tress and other systemic manifestations of the drug. His clinical tests were made in 21 patients, including 16 of various forms of hyperthyroidism and 4 with some suggestion of hypothyroidism. Epinephrin in doses of 0.002 to 0.006 Gm. ( $\frac{1}{32}$  to  $\frac{1}{10}$  grain) was given in a gelatin capsule on an empty stomach. Out of 28 observations made in the 21 patients, in 7 the blood-pressure was increased by 15 mm. Hg or over; in 6, increased by 5 to 15 mm.; in 6, unchanged, and in 9, lowered by 2 to 10 mm. In the 7 cases with a pronounced increase, the rise in systolic pressure was: 16, 18, 20, 28, 30, 50 and 110 mm. The rise in diastolic pressure in all cases was about proportionate to the systolic rise. The duration of the rise ranged from 36 to 90 minutes. Effects on the blood-pressure, pulse rate and basal metabolism showed no perceptible parallelism.

*Intracutaneous* injection of epinephrin in human subjects, according to J. D. Pilcher (Jour. of Lab. and Clin. Med., Dec., 1927), is usually followed promptly by the systemic effects of the drug. The action is much more pronounced than with the same quantity given subcutaneously, and probably somewhat greater than with intramuscular administration.

**ADRENALIN TEST.**—In Dresel's method of performing this test, as employed by Kylin (Zeit. f. klin. Med., May 4, 1926), 1 mgm. ( $\frac{1}{65}$  grain) of adrenalin is injected subcutaneously. In most normal subjects a rise of blood-pressure in 1 or 2 minutes results. The rise reaches its height—15 to 20 mm. Hg—in 5 or 10 minutes, and return to normal occurs in 45 to 60 minutes. In vagotonic patients there is a primary lowering of the pressure, while in sympathicotonia there is an exaggerated rise, or, there may be a primary depression followed by an unusual rise. The vagotonic response takes place in a majority of patients with diabetes, hypertension, bronchial asthma or peptic ulcer, while the sympathicotonic response is customary in Graves's disease, acute nephritis, and the final stages of hypertension with renal disease. In functional neuroses either type of response, or a normal response, may be observed. In vagotonia the potassium-calcium ratio is shifted toward the potassium, and calcium and atropine are

indicated therapeutically. In sympathicotonia there is a shift toward the calcium, while in amphotonia both ions are increased.

Both the vagotonic and the sympathicotonic reaction can be changed toward the normal, according to Zondek and Behrendt (*ibid.*, June, 1926), by injections of a vegetable protein or even by intragluteal injections of olive oil. In obesity the response was also modified according to whether the diet was causing retention of water and salt or not. Apparently the action of the adrenalin is determined by the colloidal condition of the tissues and capillaries. Probably this is true also of the thyroid product; if so, it may account for the failure of thyroid to remove fat deposits in the subcutaneous tissue, rich in water.

**THERAPEUTICS.**—Further reports on *intracardiac injection* of adrenalin have been contributed by Pasano (Minerva med., June 30, 1927). In one case, a man of 65, being operated on for intestinal obstruction under spinal anesthesia, developed convulsions, cyanosis, respiratory arrest, muscular relaxation, pallor and cardiac arrest. Intracardiac injection of 1 c.c. (16 minims) of adrenalin was completely successful, recovery following. Another patient was a man of 45 being operated on for strangulated hernia, likewise under spinal anesthesia. He was in a very poor condition and almost pulseless. Under the anesthetic, collapse and cyanosis were soon followed, despite artificial respiration, by pallor and cardiac arrest. Again, recovery followed intracardiac therapy. The last case was that of a woman of 32, undergoing laminectomy under local anesthesia for fracture of the spine with complete section of the cord. After  $\frac{1}{2}$  hour respiration stopped, and in spite of artificial respiration pallor supervened, with dilated pupils, loss of the corneal reflex and cardiac arrest. Injection of 1 c.c. of adrenalin restored heart action, spontaneous respiration, the normal color of the skin and the corneal reflex. After another  $\frac{1}{2}$  hour respiratory and cardiac arrest again occurred, with restoration under 2 c.c. of adrenalin, but for a shorter time than before. A third injection of 2 c.c. had only slight effect, the heart then stopping permanently. This case, while a failure, demonstrated the powerful action of adrenalin.

According to J. D. Pilcher (Jour. Amer. Med. Assoc., July 9, 1927), epinephrin subcutaneously or intramuscularly gives temporary relief from severe itching in the eczema of certain infants. Seven such infants received a total of over 20 injections and about  $\frac{3}{4}$  of them were relieved. The relief is prompt, often within 2 minutes (just as in urticaria), and may persist for an hour or more. The dose was from 0.1 to 0.3 c.c. ( $1\frac{1}{2}$  to 5 minims) of the 1:1000 solution—seldom more than 0.2 c.c. (3 minims). There were no harmful results, though occasionally pallor of the face and extremities (from vasoconstriction) was noted for a few minutes. There was some variation in the reaction to the drug, one 9-kilo. infant being relieved by 0.15 c.c. ( $2\frac{1}{4}$  minims) and becoming pale with 0.2 c.c., while another infant of only 5.5 kilos., but of about the same age, required 0.2 for relief and showed pallor only with 0.3 c.c. In adults, A. Holländer (Deut. med. Woch., Mar. 13, 1925) had already noted marked reduction of itching in 3 cases of eczema and in other itching skin lesions.

In paraphimosis, adrenalin has been found repeatedly useful by Y. Deva (Lancet, May 1, 1926). The end of the penis is wrapped with cotton soaked in a mixture of equal parts of 1:1000 adrenalin chloride and 10 per cent. cocaine hydrochloride solution. The compress is kept in place for about 15 minutes by a bandage with moderate compression. On removal of the compression the edema will be found to have completely disappeared, and with a little traction the prepuce can be restored to its normal position.

#### ADRENALS.—PHYSIOLOGY.—

Several studies relating to the secretion of a hormone by the *suprarenal cortex* have been published of late. J. M. Rogoff and G. N. Stewart (Science, Oct. 7, 1927) find that intravenously injected extracts of fresh suprarenals in some may prolong the life of adrenalectomized animals. They believe that the epinephrin present in the extracts could not have been responsible for this result, as no such effect was observed when epinephrin equal to the maximum amount which could have been contained in the extract was injected. F. A. Hartman, C. G. MacArthur and W. E. Hart-

man (Proc. Soc. of Exp. Biol. and Med., Oct., 1927) state they have obtained from the cortex of ox adrenals a substance which prolongs the life of adrenalectomized cats. The substance is obtained by freeing extracts of the glands as much as possible from protein and then precipitating with salt. The epinephrin is removed by washing.

Trying out the effects of injection of extracts of adrenal cortex on cases of pernicious anemia, R. Stephan (Med. Klin., Apr. 30, 1926) observed an almost immediate drop in the erythrocytes, succeeded in a few hours by an increase and then a return to normal. The coagulation time, already short in pernicious anemia, is at first shortened further and then lengthened. A similar curve is shown by the blood sugar. The writer's explanation for the effect on the red cells and coagulation is that the "hormone" of the adrenal cortex causes a temporary blocking of the reticulo-endothelial cells.

Numerous experimental studies of the effects of experimental *suprarenalectomy* have recently been carried out. F. G. Banting and S. Gairns (Amer. Jour. of Physiol., June, 1926) found that, of 16 dogs subjected to one-stage bilateral suprarenalectomy, all died in from 8 to 54 hours. Of 37 dogs in which the operation was done in 2 stages, 10 days to 6 weeks apart, 12 lived less than 20 hours, 10 from 50 to 100 hours, 10 from 100 to 150 hours, 3 from 150 to 200 hours, and 2 from 200 to 238 hours. The principal chemical changes found in the blood were an increase in the urea and non-protein nitrogen and a decrease in the percentage of chlorides. The postmortem findings of enlarged lymph-glands, degeneration of the liver cords, and nephrosis strongly indicates the accumulation of a toxic substance as a result of the operation. Furthermore, the blood of dogs which died a true "desuprarenal" death proved to be toxic. A protein diet shortened the period of survival. The fact that histamine is 30 times more toxic after suprarenalectomy also suggests that the poison accumulating is of a protein-like nature.

Marine and Baumann (Amer. Jour. of Physiol., June, 1927) have found that administration of normal salt solution, Ringer's solution and isotonic sodium acetate solution increases the duration of life after

suprarenalectomy about 3 times. Evidently, diuresis is an important factor determining the duration of life. When the loss of water by diuresis is made up by an additional intake, life is prolonged; if not, it is shortened. Corey (*ibid.*, Feb., 1927) stresses oral administration of large amounts of fluid as prolonging life after the operation, while Zwemer (*ibid.*) finds large quantities of 5 per cent. dextrose solution by mouth similarly beneficial. According to Swingle (*ibid.*), death following the operation may be due to either hypoglycemia or acid intoxication, since both of these are invariably associated with adrenal insufficiency. The former can be corrected by injecting dextrose, while the acidosis seems due to failure of the kidneys to eliminate acids properly.

While unilateral suprarenalectomy did not usually modify the blood-pressure, A. Biasotti (Semana méd., May 12, 1927) found that the bilateral operation caused a progressive decline of pressure, if death occurred in 40 to 60 hours; if death was delayed, the low pressure became almost stabilized. Removal of one entire gland and of only the medulla of the other caused a low blood-pressure which passed off after 20 to 30 days. E. M. and L. L. MacKay (Jour. of Exp. Med., Mar., 1926) found that removal of one adrenal was followed by hypertrophy of the other, due entirely to enlargement of the cortex, this enlargement, in turn, being the result largely, if not entirely, of an increased size of the cortical cells. Zwemer (Amer. Jour. of Physiol., Feb., 1927), like Biasotti, observed that animals retaining only the cortex of one adrenal with its blood-supply undisturbed survived indefinitely.

J. T. Lewis and A. Torino (C. r. Soc. de biol., Jan. 28, 1927) noted an increased susceptibility to morphine in adrenalectomized rats, while Crivellari (*ibid.*) observed an increased susceptibility to potassium cyanide, nicotine, acetonitrite and histamine.

From an experimental study of *carbohydrate metabolism* in adrenal insufficiency, P. Estrada (Santa Fé méd., Apr., 1926) concluded that the cortex favors the formation of glycogen from glucose, whereas the medulla, as well as adrenalin, promote the change of glycogen into glucose. Injecting adrenalin extract into pigeons fed

on polished rice, Schmitz and Reiss (Biochem. Zeit., Apr. 7, 1927) found that the customary neuritic manifestations and changes in the blood lipoids were thereby prevented.

Mouriquand and Leulier (Bull. de l'Acad. de méd., May 17, 1927) found but little adrenalin in the adrenals of guinea-pigs when these organs were removed at once; but if the glands were then left for 1 day *in vacuo* in the presence of sulphuric acid, the amount of adrenalin became 2 or 3 times as large. Thus, a portion of the adrenalin is not revealed by the usual reactions in fresh adrenals. Again, where the adrenals were removed 1 day after the animals were killed, the total amount of adrenalin (free and detectable only after vacuum treatment) was lessened by  $\frac{1}{2}$  or  $\frac{3}{4}$ .

*Cardassin* is the name applied by H. G. Cameron (Endocrinol., Nov.-Dec., 1926) to a new compound extracted from the suprarenals of cattle. It increases the heart-rate. The rate of the isolated guinea-pig heart is increased as much as 120 beats for 45 minutes. Injected subcutaneously, it increased the heart-rate in various mammals for long periods.

Formaldehyde in small amount was found by Abelous and Delas (C. r. Soc. de biol., Apr. 23, 1926) in human urine and in the blood—especially the venous blood—of dogs, rabbits and other animals. These observers incline to the view that the formaldehyde in the vena cava may inactivate the adrenalin normally secreted by the adrenals; this would explain why no adrenalin is ordinarily found in the vena cava, although it is being continually secreted by the adrenals. The adrenalin inactivated by the formaldehyde seems to be eliminated in the urine.

Discussing recent experimental evidence as to the *relation of the suprarenal cortex to the thyroid and thymus*, D. Marine (Arch. of Path. and Lab. Med., Feb., 1926) asserts that suprarenalectomy not only delays involution of the thymus and lymphoid tissues, but also actually causes their regeneration. Thyroidectomy prevents this reaction even after combined suprarenalectomy and gonadectomy. Suprarenalectomy plus gonadectomy is a more powerful stimulus for thymus and lymphoid regeneration than either of these influences alone.



The combined effect of these 2 factors results in certain lymphoid and thymus hyperplasia in rabbits and rats, which persists until regeneration of accessory interrenal tissue corrects the physiologic effect. The syndrome thus experimentally produced resembles status lymphaticus and is believed to depend mainly on a partial loss of certain functions in the interrenal and sex glands rather than of the chromaffin tissue. The lymphoid and thymic hyperplasias of infancy are believed due to a functional under-development of the interrenal and sex glands of varying intensity. The "lymphatic constitution" underlying or accompanying exophthalmic goiter and Addison's disease also appears to be dependent on partial suppression of certain functions of these glands.

In regard to the *effects of the X-ray* on adrenal function, Zimmern (Trib. méd., Jan., 1928) points out that small doses generally give rise to increased blood-pressure. Pathologic study of irradiated adrenals rarely shows any effect on the medullary portion, changes being found only in the cortex. Under abnormal conditions in man, however, *viz.*, in hypertension independent of any renal lesion or vascular sclerosis, lowering of blood-pressure is obtainable with the X-rays. Thus, in a recent case of Laubry's, with paroxysmal hypertension refractory to all remedial measures, large doses of penetrating X-rays undoubtedly lowered the pressure by a direct effect on the adrenal parenchyma. In another patient with **high blood-pressure**—300 mm. systolic—a series of X-ray treatments in small dosage gradually lowered the pressure, which remained stationary some months later at 230. Such results from small doses could hardly be ascribed to a direct action on the adrenals; the writer would account for them through a controlling effect on these organs exerted by the vegetative nervous system. Clinically, high X-ray dosage is necessary in presumed disorders of the adrenal parenchyma (Josué's adrenovascular syndrome), while moderate doses should be employed in functional disturbances due to loss of harmony of the endocrin synergistic activities (high blood-pressure of the menopause, of overworked individuals, etc.). Zunz and La Barre (Belg. Letter, Jour. Amer. Med.

Assoc., Apr. 23, 1927) have proved experimentally that the Röntgen rays produce a marked and prolonged suprarenalinemia. Variations in the blood caused by these rays are in direct relation to the increase in epinephrin in the blood-stream.

Autoplastic *transplantation* of the suprarenal cortex was found feasible in guinea-pigs by H. L. Jaffe (Jour. of Exp. Med., Apr., 1927). Such a transplant into the abdominal wall may remain for months, growing to fairly large size. Homoplastic transplants usually degenerate after a few months. Small autoplastic transplants are capable of maintaining the life of a completely adrenalectomized guinea-pig for weeks, and large transplants maintain the animal indefinitely in good condition. Irritation phenomena follow the grafting of suprarenal cortex because of the entrance of epinephrin into this tissue during the manipulation involved in removal of the gland.

Tournade (Paris méd., May 1, 1926) notes that many still oppose the view that the suprarenal hormone is normally poured into the blood in sufficient amount to play a continuous physiologic rôle and, in particular, to participate in maintaining the blood-pressure. He describes 5 groups of experiments which, on the contrary, tend to show a constant cardio- and angiotonic rôle on the part of adrenalin. The method of suprarenajugular (or suprarenorenal) vein anastomosis between 2 dogs was employed. (1) The marked lowering of blood-pressure following 2 to 6 hours after bilateral adrenalectomy was counteracted in a few minutes by entrance of blood from the suprarenal vein of another dog into the jugular. (2) In the same experiment, successive reduction and restoration of blood-pressure are obtained upon cutting off and later re-establishing the anastomosis. (3) The manifest signs of hypoadrenalinemia in the reacting dog, through inhibition of adrenal secretion in the donor dog following such procedures as weak stimulation of the central end of the vagus, hypertension through intravenous injection of blood or adrenalin, etc., in the donor dog constitute evidence of a physiologic adrenalinemia, which could not be lowered if it did not exist. (4) If, in the donor dog, the splanchnic nerve on the side of the adrenal the

vein of which is joined to the jugular of the reacting dog is cut, the latter dog (adrenalectomized) behaves just as if the anastomosis had been severed; its blood-pressure falls and its spleen dilates. Cutting the splanchnic is thus shown to arrest a normally active adrenal secretion. (5) The splanchnic impulses normally maintaining adrenal secretion imply a constant activity of the adrenalino-secretory nerve-centers. This is experimentally confirmed in that when 2 dogs are united by suprarenal jugular vein anastomosis, cocainization of the medulla of the donor dog gives rise, in the adrenalectomized dog, to all of the circulatory disturbances customarily attending section of the anastomosis or of the splanchnics.

The experiments of Gley and Quinquaud, which seemed to negative the existence of a constant physiologic adrenalinemia, were repeated by the writer with slight modifications which led to the conclusion that the experiments of these observers had been misleading.

**HYPOADRENIA.**—Several different views have been advanced as to the cause of death in *malignant diphtheria*. Nearly always this is a toxic type of death, occurring either early or late in the course of the disease. A. Ravina (Presse méd., Apr. 6, 1927) calls attention to the recently published interpretation of Chalier, Brochier, Chaix and Grandmaison (Jour. de méd. de Lyon, Jan. 5, 1927) to the effect that these deaths are due principally to renal failure with azotemia and to adrenal insufficiency with loss of the antitoxic and adrenalinogenous functions of these organs. In 7 cases, azotemic nephritis attended the course of a fatal diphtheria, while in 2 sudden death occurred in the presence of extensive adrenal hemorrhages. The clinical manifestations of adrenal failure in diphtheria are asthenia, with apathy, immobility and prostration; frequent vomiting, sometimes pernicious, especially in children; ab-

dominal pain with pallor and gastrointestinal and cardiac disturbances; sometimes a rapid wasting of the muscles, out of proportion to the reduction of food intake and comparable with the emaciation witnessed in experimental partial adrenalectomy. In malignant diphtheria there appears to attend acute adrenal inadequacy a low blood-pressure, especially systolic, weak heart sounds, rapid pulse and loss of myocardial tone. Macroscopic lesions of the adrenals in these cases consist, according to Chalier *et al.*, only of a purplish discoloration and sometimes a few superficial hemorrhagic suffusions or small hematomas in one pole of the capsule; microscopically, however, there are very obvious hemorrhages, at times even resulting in dislocation of the adrenal cortex. The medulla seems unaffected, or affected only at the line of puncture with the cortex. Often the connective tissue capsule is likewise the seat of intense vascular dilatations. Lereboullet and Gournay (Soc. de péd., Dec. 15, 1925) have reported favorable effects from suprarenal organotherapy in grave diphtheria.

The clinical symptoms in a case of bilateral *thrombosis of the suprarenal veins* and acute retrogressive changes of the suprarenal glands have been described by E. F. Hirsch and J. A. Capps (Arch. of Int. Med., July, 1927). The autopsy showed no other complicating lesion. In addition to the usual symptoms of adrenal insufficiency, such as asthenia, low blood-pressure, gastrointestinal disturbances and syncope, there were sudden attacks of extreme cyanosis, with dyspnea and unconsciousness. The condition differed from heart disease

in that the attacks of cyanosis appeared before the dyspnea. The sudden onset of the attacks was not unlike the acute insulin insufficiency of diabetic coma, suggesting either an overwhelming wave of some toxic substance or, more likely, the acute need of suprarenal substance in tissue metabolism. On this basis the sudden attacks of cyanosis suggest that the suprarenal substance may be important in the utilization of oxygen.

In a case of essential suprarenal insufficiency in a man aged 28, reported by E. M. Medlar (Amer. Jour. of Path., Mar., 1927), the entire illness was of about 13 days' duration. Extreme cyanosis occurred, with other symptoms, and the autopsy showed a marked atrophy of the cortex of the adrenals and fibrous changes of the cortex and medulla. There was a marked hyperplasia of the lymphoid apparatus, including the spleen.

**ADRENAL TUMORS.**—The occurrence of *pubertas præcox* as a result of adrenal tumor was illustrated in the case of suprarenal carcinoma reported by M. B. Gordon (Endocrinol., July-Aug., 1927). Onset of the growth had been noticed at the age of 9 months, and at 3 years the child was of herculean build, had a mannish voice, acne, pubic hair, a light mustache, the external genitals of a boy of 16, and premature ossification. His mentality was somewhat below that of a child of his actual age. Autopsy showed a carcinoma of the left suprarenal extending into the left suprarenal vein and inferior vena cava with metastases in the lungs. The right suprarenal was absent. The portion of the left suprarenal not involved by the tumor showed a picture generally found at the time of puberty. The testes, however,

were immature. The thymus showed involution; the thyroid contained colloid, and the pancreas, pituitary and pineal were normal.

T. E. Gibson (Cal. and West. Med., Feb., 1927) brings out the fact that adrenal tumors give rise to 3 *distinct syndromes*: (1) The genitosuprarenal; (2) the Hutchison, and (3) the Pepper. The *genitosuprarenal syndrome* occurs only in *cortical tumors* (carcinoma, hyperplasia, adenoma), and is characterized in the female by virilism or pseudohermaphroditism and in the male by precocious puberty. The sexual changes produced are always in the direction of the adult male type, irrespective of sex. The adult male shows no characteristic sexual alterations. Cortical tumors occur as frequently in infancy and childhood as in the adult. Hypertension often exists. Pigmentation occurs rarely in cortical tumors and never in medullary tumors.

The common *medullary tumor* is the neurocytoma or "sarcoma." Medullary tumors are about as frequent as cortical tumors, but are peculiar to infancy and childhood, and occur in the Hutchison and Pepper types. The *Hutchison syndrome* begins, spontaneously or after trauma, with ecchymosis of one or both eyelids followed by unilateral exophthalmus or proptosis of the eyeball. A tumor of the orbit appears and the auricular and submaxillary lymph nodes are enlarged. The primary growth in the adrenal may remain small and escape discovery until autopsy. In the *Pepper syndrome*, neurocytoma (round cell sarcoma) of the adrenal produces in infants a rapidly enlarging abdominal tumor caused by diffuse nodular growths in the liver and adrenal. The

latter may remain small, but the liver reaches enormous proportions. There is little tendency to local extension or metastases, but the growth is rapidly fatal.

It should be borne in mind that the medullary tumors may be primary in the retina or abdominal sympathetic instead of in the adrenal. From the diagnostic standpoint, renal and adrenal tumors being so exceedingly frequent in children, differentiation limits itself practically to these tumors. A large mass, apparently hepatic, favors primary medullary tumor of the adrenal, but if the liver cannot be felt a large mass in the kidney region is very likely to be renal rather than adrenal. Unilateral exophthalmus generally rules out renal tumor. A tumor mass in the flank with sexual changes and possibly hypertension indicates cortical tumor of the adrenal.

A complete urologic examination is often of decided diagnostic help. Characteristically, the pyelogram shows the kidney pushed downward, with encroachment on the pelvis and upper calices.

In 3 cases of primary tumor of the suprarenal in which *pneumoperitoneum* was employed by Schmieden and Peiper (Arch. f. klin. Chir., Nov. 29, 1926), it led to the correct diagnosis. It is of great value in revealing these tumors. By control of the vascular supply *in situ* the origin of the tumor in the suprarenal may be determined during operation. Aside from the sexual changes in carcinoma of the adrenal cortex, attacks of pain are caused by pressure of an adrenal tumor on the dorsal or lumbar nerve-roots. Hematuria may be present and bronzing is not unusual.

In a case reported by R. M. Smith (Med. Jour. of Austral., May 7, 1927), both adrenals were involved in *melanotic* malignant growths, rare in these organs even unilaterally. There were secondary growths in the upper half of the small intestine and the mesenteric glands, but no metastases in other organs.

**Treatment.**—Too often, as noted by Gibson (*loc. cit.*), the diagnosis does not antedate the occurrence of metastases, especially in the medullary tumors. Occasionally cures by **operation** are, however, reported in adults, so that surgical interference is indicated, at least in cortical tumors. One cortical hypernephroma in a child has been successfully removed by Collett; the patient was well 2 years later and had lost most of her virilism. At operation it is essential to determine that the opposite adrenal is present and that the disease is not bilateral. **Deep X-ray** treatment should be tried where surgery is contraindicated.

A case of brilliantly successful surgical result in cortical adrenal tumor has been reported by Gordon Holmes (Quart. Jour. of Med., Jan., 1925). A young woman, aged 24, had been in excellent health up to the age of 17, when menstruation, which had been normal from 13 on, ceased abruptly; abnormal and excessive growth of hair on the chin, lips, cheeks, chest, abdomen and extremities began at about 19 years; her well-developed breasts atrophied; her general configuration strongly suggested masculinity; the uterus atrophied and the clitoris became hypertrophied; psychic disturbances were manifested by loss of erotic feelings and lack of modesty. Occasional pain in the right side of the abdomen, and finally a swelling there, led to operation, and a benign neoplasm, made up of practically normal cortical tissue, was removed. An astounding transformation occurred. The patient menstruated 36 days after



the operation (after 7 years' absence) and continued to do so regularly up to the time of report (9 years after operation). The clitoris regressed to normal size; the breasts developed again; the abnormal hairiness began to fall out soon after the operation and entirely disappeared, and her feminine contours were restored.

**HYPERNEPHROMA.**—The pathologic relation between cortical tumors of the adrenal and "hypernephromas" (Grawitz tumors) is still problematic, according to Gibson (*loc. cit.*). Opponents of the Grawitz theory have gone too far in eliminating adrenal rests as a source of kidney tumors. It is well established that adrenal rests do occur in the kidney, although rarely, and it seems very likely that they do occasionally undergo malignant changes, producing the hypernephroma or Grawitz tumor. Many tumors are wrongly called Grawitz tumors that arise from renal epithelium. In atypical cases of both varieties it may be impossible to differentiate positively. Why sexual alterations do not occur in Grawitz tumors is not understood; nor is the hypertension associated with tumors of the adrenal cortex, which contains no adrenalin.

C. G. Murray and G. S. Simpson (*Lancet*, Oct. 8, 1927) report a case of virilism due to an adrenal cortical hypernephroma, with recovery after removal of the growth. A single woman, aged 36, had had some attacks of severe abdominal pain 2 or 3 years before coming under observation. She missed her periods, increased in weight, and showed enlargement of the hands and feet, some loss of hair from the scalp, coarsening of the facial skin, a hairy growth on the face, chin and lips,

loss of interest in things, irritability and depression. The uterus and ovaries were small. There was no marked enlargement of the clitoris. The blood-pressure rose to 200 systolic and 120 diastolic. Eventually the features became florid and bloated, and the hair had fallen off from the crown and temples, giving the baldness characteristic of a middle-aged man. The breasts had shrunk. Emotions and affections had disappeared. The opposite sex ceased to have any attraction. A tumor was felt deeply in the right loin. The pulse-rate was 110.

At operation a tumor about the size of 2 fists was removed. The facial skin then showed exfoliation and scaling, the hirsuties lessened and eventually disappeared, and the scalp hair began to grow again. The patient lost 30 pounds, and her exaggerated appetite returned to normal. She took more interest in her house and clothes, and felt more energetic. The hands returned to their previous dimensions, there was a general return to the feminine softness, and the menses reappeared. The systolic pressure returned to 130, though still easily raised to 190 or 200 by slight excitement. The pulse rate remained slightly above normal. In this case a gross disturbance of endocrin balance, not only between the adrenals and ovaries, but also between the adrenals and thyroid, is suspected to have occurred.

**ALBUMINURIA.**—In a study of albuminuria in children, J. K. Calvin, B. L. Isaacs and J. Meyer (*Jour. Amer. Med. Assoc.*, June 12, 1926) compared a group of 189 children recruited from the homes of the very

poor, with bad hygienic conditions, improperly balanced diets, teeth, tonsils and other potential foci of infection neglected, undernourishment and anemia, with 331 children in a well-regulated orphans' home under watchful medical supervision. Of the former group 63 per cent. had foci of infection and 60 per cent. albuminuria; in the latter group, all free of foci of infection, 15 per cent. had albuminuria. The conditions obtaining in the first group evidently play an important rôle in the "benign" albuminurias of children; many cases respond, indeed, to the treatment of these etiologic factors. The albuminuria in many cases was transitory, as revealed by repeated uranalyses. Most of these benign albuminurias are not of the orthostatic type. Some may be considered physiologic or growth albuminurias, but many other etiologic factors may be present, removal of which permanently dispels the condition. Among the foci of infection, chronically infected tonsils, adenoids, nasal sinusitis and abscessed teeth are the chief offenders. Likewise, overcoming undernourishment and anemia often removed the albuminuria. The writer offers the following simplified classification of the benign albuminurias:

(a) Malnutrition albuminuria, frequently associated with anemia, underweight and systolic basal murmur. Foci of infection are common causes of this malnourished condition.

(b) Orthostatic albuminuria, associated with posture.

(c) Idiopathic or "growth" albuminuria, including the terms juvenile, puberty, cyclic, transitory and intermittent.

In the treatment the writers do not advise any excessive rest cure or re-

stricted low protein diet; such measures may do harm to children physically under par. The only restrictions should be those necessary to overcome any malnutrition. Stress should be laid on **physical development** in the orthostatic group.

Of 1000 boys 14 years of age, 58 were found by H. H. Bashford (Lancet, Dec. 25, 1926) to have *adolescent* albuminuria. In a considerable number of instances, this condition persists for many years, if not throughout life. Its presence is consistent with the prospects of a perfectly normal life of physical efficiency. In a great majority, the after-rest urine specimen (after a period of sleep or the usual night's rest) is usually free of albumin. Cases with albumin consistently found in the after-rest specimen should be regarded more seriously. Adolescent albuminuria is not definitely associated with any particular type of youth or man, with a "nervous" disposition, lordosis, oxaluria, or a history of scarlet fever.

In an old woman with sclerotic kidneys and cardiac decompensation, Stepp and Peters (Deut. Arch. f. klin. Med., Nov., 1926) observed an excessively high albuminuria, estimated at 28 per cent. The urine showed the uniquely high specific gravity of 1.1122. The urine chlorides were 0.32 per cent. and the blood chlorides, 0.734 per cent. The observation can scarcely be accounted for on any theory other than that of reabsorption of water in the kidneys. The patient had received theobromine a few days before the albumin determination.

Agents causing *renal vasoconstriction* have been found by I. Starr, Jr. (Jour. of Exp. Med., Jan., 1926) to cause transient albuminuria in anesthetized eviscerated dogs. The facts

observed may be explained by the conception that renal vasoconstriction causes an increase in the duration and extent of the normal intermittent interruptions in the glomerular circulation. Permeability of the glomerular membranes is so increased by these lengthened interruptions that when blood flow is reestablished albumin escapes. This conception might apply to those albuminurias in man which result from excessive muscular exercise or emotion or which are produced reflexly. It may explain the occurrence of albuminuria in normal people and healthy laboratory animals, and may partly explain the albuminuria which occurs after anesthesia or in cardiac decompensation.

The elimination of water in individuals with *orthostatic* albuminuria, after drinking 1 liter of water or salt solution, was studied by R. Seyderhelm and E. Goldberg (*Zeit. f. klin. Med.*, May 27, 1927). The excretion was found greater than normally, even in the upright position. Extrarenal water elimination was likewise higher. Evidently there is a considerable, general disturbance of water metabolism in these subjects.

In the obstinate albuminuria of nephritis with chloride retention and edema, Chabanier, Lebert, Lumière and Lobo-Onell (*Bull. de l'Acad. de méd.*, July 26, 1927) found that Epstein's treatment by a **high nitrogen diet** (as long as it does not modify the renal function as estimated by Ambard's coefficient), together with intensive and prolonged **thyroid** medication, is capable of giving excellent results, even where salt restriction has failed. The edema and albuminuria disappear. These facts are in favor of the theory of modification of

the plasma proteins in these cases of nephritis, with resulting lowered osmotic tension causing edema. The osmotic tension was found to rise and the plasma proteins to return to normal *pari passu* with the improvement in the clinical manifestations.

**ALBUMIN TESTS.**—Until recently, it was generally agreed that the protein in the urine might be identified as either serum albumin or serum globulin (euglobulin), or a combination of the two. The investigations of W. H. Welker, quoted by Calvin *et al.* (*loc. cit.*), have disclosed, however, that by means of the precipitin test the protein in urine may be identified as coagulable protein not precipitated in the cold by acetic acid (serum albumin, pseudoglobulin); or coagulable protein precipitated in the cold by acetic acid (euglobulin); or non-coagulable protein precipitated in the cold by acetic acid (mucin, nucleoprotein), or non-coagulable protein not precipitated by acetic acid at all (proteoses). There is no simple test for separating euglobulin, mucin and nucleoprotein, but all of these are precipitated in the cold by acetic acid. In the studies of Calvin *et al.*, Welker's disclosures were taken into account in that 2 separate tests of the urine were made. First, a test-tube filled  $\frac{2}{3}$  with clear urine was heated to boiling at the upper portion of the urine, and 5 to 6 drops of 5 per cent. acetic acid added. The result was viewed against a black background, and only those urines showing no cloudiness considered normal. A test for euglobulin was then made by adding the acetic acid to unheated urine. It was found that 58 per cent. of the urines with a positive protein reaction contained either euglobulin, nuclealbumin, mucin, or all of them, which precipitated out when acetic acid was added to the cold urine. As 26 per cent. of the total number of urines analyzed were more positive with hot urine than with cold, it was assumed that, at least in this number, serum albumin or pseudoglobulin or both were present, since this percentage reacted only with heated urine. In  $\frac{2}{3}$  of the analyses, the heat and cold tests agreed (either positive or negative). Evidently, either euglobulin, nuclealbumin and mucin, or all, are promi-

nent components of the urinary protein in benign albuminuria, though serum albumin or pseudoglobulin may occur alone.

A *quantitative test* for albumin, based on the fact that alkaline solutions will dissolve a definite amount of coagulated albumin, is described by A. de Avila (Rev. mex. de biol., Mar., 1926). With 5 c.c. of an acid precipitating solution (consisting of alcohol, 50 c.c.; distilled water, 45 c.c., and trichloroacetic acid, 5 Gm.) are mixed 5 c.c. of the fluid under test. The resulting 10 c.c. of fluid having been divided between 5 test-tubes, there is added in each 1 c.c. of 2 per cent. potassium hydroxide solution, previously tinted red with a few drops of phenolphthalein solution. The alkaline solution is then further added to each tube in amounts ranging from 0.1 to 0.6 c.c. The end reaction is reached and the reading made from the first tube in which the protein is dissolved, the fluid clears, and the tint deepens. Where cerebrospinal fluid under test contains much protein, either it or the reagents may be suitably diluted previous to the test.

Having observed that diluting urine with water increased the inaccuracy of urinary albumin determinations by the commonly used Esbach test, A. M. Moody and L. Stocking (Cal. and West. Med., Sept., 1926), after much experimenting, decided upon the use of a standard solution for comparative purposes. This standard solution consists of 5 c.c. of pooled human blood serums diluted to 100 c.c. with 2.5 per cent. sodium chloride solution. This standard solution yields by gravimetric determination an albumin content of 6 Gm. per liter. With this solution the time required for quantitative testing was reduced from the 24 hours needed in the Esbach test to 15 minutes by adopting a modified Purdy test instead of the Esbach. The actual test procedure is, accordingly, as follows: Place in a 15-c.c. graduated centrifuge tube 10 c.c. of urine, and in another similar tube 10 c.c. of standard serum solution. Then add to each tube 5 c.c. of Tsuchiya's reagent (phosphotungstic acid, 15 Gm.; hydrochloric acid, 50 c.c., made up to 1000 c.c. with 95 per cent. alcohol). Mix thoroughly by inverting back and forth, and let stand for 10 minutes; then place the tubes in the centrifuge and centri-

fugalize for 3 to 5 minutes. Record the amount of precipitate in each tube and calculate the result, bearing in mind that the standard tube reading equals 6 Gm. of albumin per liter. If, after the centrifuging, there is the slightest turbidity of the supernatant fluid, the original specimen must be diluted with 2.5 per cent. sodium chloride solution and the whole procedure repeated. In over 1000 determinations by the above technic, with frequent checks by the time-consuming gravimetric method, the average difference was a reading only 3 per cent. higher by the centrifuge method. The latter is therefore commended for routine use as a simple, time-saving and sufficiently accurate procedure.

**ALCOHOL.—PHYSIOLOGIC ACTION.**—In a study of the action of alcohol on the *basal metabolism*, Zahn (Zeit. f. Hyg. u. Inf., Apr. 29, 1927), determining the rate 9 or 10 hours after ingestion of 80 to 100 Gm. of alcohol in various forms, observed a moderate increase of metabolism.

A. Bickel and A. Elkeles (Arch. f. Verd., Dec., 1926) investigated the effects of ethyl alcohol on *gastric secretion*. In concentrations up to 10 per cent. it increased gastric secretion without inducing an increase of the mucus. In concentrations exceeding 10 per cent., it paralyzed the secretory glands and increased the production of mucus. Its effects on the gastric glands are exerted on the parasympathetic intermediary substance of the gland cells. The effects of beer on the gastric glands correspond with those of solutions of alcohol in water of like concentration.

The *diuretic* action of alcohol has recently been studied by Mosonyi and Gömöri (Arch. f. exp. Path. u. Pharm., July, 1927). Dogs were given by stomach tube either 5 per cent. alcohol, a 0.2 per cent. solution of caffeine, or distilled water, and the urine with-



drawn by catheter 5 hours later. In each instance the output of urine was increased, but the elimination of electrolytes was increased only when alcohol or alcohol combined with caffeine had been given.

*Color perception* may be disturbed by alcohol, according to Zeiner-Henriksen (Norsk Mag. f. Læg., July, 1927), who found that it reduced the ability to distinguish color differences even when taken in amounts insufficient to intoxicate. In individuals required to distinguish colored signals, this effect of alcohol may be of marked practical significance. Cocaine, strychnine and other poisons, similarly studied, were found to have different actions on color perception.

Discussing the effects of definite amounts of alcohol from the standpoint of the production of intoxication, P. Schmidt (Deut. med. Woch., June 18, 1926) asserts that, in diluted beverages, alcohol in amounts up to 25 Gm. is devoid of harmful action. Slight symptoms of intoxication may result in those unaccustomed from 50 Gm., severe intoxication from 100 Gm. taken within 2 hours. Good light wines and beer are the best weapons against alcoholism. In dealing with alcoholism in Germany, the writer would favor a low tax on beer with a maximum alcohol content of 3 per cent. and on wine with 7 per cent., with a rapidly rising tax on stronger liquors, according to their alcohol content.

**UNTOWARD EFFECTS AND ALCOHOLISM.**—*Liver injury* in acute alcohol poisoning has been investigated by Wallace (Proc. Soc. Exp. Biol. and Med., Mar., 1927) by means of the indirect van den Bergh quantitative test for bilirubin and by

the quantitative determination of urobiligen in the urine. In the 17 cases studied an increase in the bilirubin in the blood serum was found, which persisted for 4 or 5 days, with a gradual decline to normal. The urobiligen curve closely corresponded to the bilirubin curve. The increase of bilirubin and urobiligen was directly proportionate to the severity of the poisoning. Thus, in acute alcohol poisoning there is definite evidence of liver injury.

An outstanding contribution relative to the more accurate *diagnosis of acute alcoholic intoxication* has recently been made by E. Bogen (Jour. Amer. Med. Assoc., Oct. 29, 1927), who points out that a person may be under the influence of alcohol to an extent seriously affecting his powers and behavior, *e.g.*, in driving an automobile, without presenting the entire picture of drunkenness (odor of alcohol, dilated pupils, flushed face, staggering gait, confused thick speech, boisterous behavior). Further, acute febrile disturbances and many general or local disorders may simulate acute alcoholism. For more accurate diagnosis, he favors a quantitative determination of the alcohol in the urine, breath or body fluids. In determining the alcohol in the urine, blood or spinal fluid, 1 c.c. of the specimen is placed in a test-tube and a current of air bubbled through it and then through 5 c.c. of a  $\frac{1}{3}$  per cent. solution of potassium dichromate in 50 per cent. sulphuric acid for 10 minutes, both tubes being immersed in a boiling water bath. The color change, from reddish-yellow to greenish-blue, is then measured by comparison with a series of standards previously made up with known amounts

of alcohol. For determining the alcohol in the breath, 2 liters of expired air, collected in an ordinary football, are bubbled through 5 c.c. of a hot solution of  $\frac{1}{3}$  per cent. potassium dichromate in sulphuric acid and the color change similarly measured.

In a large series of tests, no patient having less than 1 mgm. of alcohol in 1 c.c. of urine was pronounced intoxicated, but more than  $\frac{1}{2}$  of those with from 1 to mgm.,  $\frac{3}{4}$  of those with 3 mgm., and almost all with 4 mgm. or more, were so diagnosed. Detailed study of the clinical observations showed a convincing relationship between the concentration of alcohol in the urine and the physiologic effects.

CLINICAL OBSERVATIONS IN 250 PATIENTS:  
PERCENTAGE INCIDENCE BY ALCOHOLIC  
CONTENT OF URINE.

Mgm. alcohol in 1 c.c. urine ....	0	1	2	3	4	5
% "acute alcoholic intoxication" .	0	56	66	88	97	100
% kept at hospital .	54	31	50	60	71	100
% admit drinking .	43	58	53	47	43	15
% alcoholic odor ..	40	82	84	76	91	100
% flushed face ....	18	50	50	44	23	31
% pupils dilated ..	25	56	34	42	34	38
% incoordinated ...	23	66	86	89	100	100
% staggering gait .	36	60	45	62	44	15
% unable to stand at all .....	0	0	26	27	56	85
% sway when stand- ing .....	46	81	54	68	44	15
% unable to speak .	0	0	23	14	34	85
% speech confused .	14	45	34	58	55	15
% speech slurred .	22	20	15	25	11	0
% comatose .....	0	0	15	13	31	100

Similar observations were obtained with the alcoholic content of the breath. As soon as the disturbing factor of alcoholic liquor still in the mouth is removed—usually within 15 minutes after imbibition—the alcoholic content of 2 liters of expired air slightly exceeds that of 1 c.c. of urine. Though less than  $\frac{1}{6}$  of those with less than 1 mgm. of alcohol in the breath were found to be intoxicated, more than  $\frac{1}{2}$  with 1 to 2 mgm.,

and nearly all with more than 3 mgm., were so pronounced.

At least  $1\frac{1}{2}$  ounces (45 c.c.) of absolute alcohol, corresponding to 3 ounces (90 c.c.) of 50 per cent. whisky, must have been taken for each milligram per cubic centimeter appearing in the urine, or nearly  $\frac{1}{2}$  pint to produce the fifth stage of true alcoholic coma.

A case of transient aseptic puriform meningeal reaction with epileptic manifestations, apparently due to alcoholism, is reported by Giraud, Puech and Chardonneau (Bull. Soc. des sci. méd. et biol de Montpellier, Feb., 1927). A drayman aged 35, heavy drinker, had epileptoid seizures with unconsciousness for 5 successive days. On admission to the hospital he was comatose and had definite epileptic seizures every 2 or 3 minutes. Lumbar puncture withdrew a puriform, very slightly bloody fluid, without abnormal pressure. After a subcutaneous injection of 4 c.c. (1 dram) of *somnifen* the seizures became less marked and finally ceased. No bacterial agent was revealed by culture of the spinal fluid, which by the 8th day was quite clear again. On the 9th day consciousness was regained, and recovery soon followed. The patient had had no previous epileptic seizures. While he had a very slight febrile temperature for 11 days, and the meningeal reaction might possibly have been incited by a slight grippal infection, the alcoholism is believed to have been the main factor in the disturbance.

Discussing *chronic alcoholism*, Stockert (Zeit. f. d. ges. Neur. u. Psych., Dec. 15, 1926) divides the subjects, aside from epileptics and the insane, into the social drinkers and the true drunkards. The latter are subdivided into 2 groups, the first of which comprises weak, indifferent and coarse individuals, who drink because it is the easiest way to secure pleasure and

get rid of sensations of depression. These subjects recognize no harm in drinking and do not attempt to stop. In the second group are psychopaths, who try to combat their desire for drink, but are compelled to continue after ingesting the first glass. These are depressed, sensitive and asocial individuals, who can face their environment only when intoxicated.

The *blood chemistry* of 51 cases of chronic alcohol poisoning or delirium tremens was investigated by E. and I. Keeser (Arch. f. exp. Path. u. Pharm., June, 1926). Modifications in the fat metabolism were found, together with a diminution of phosphates, soaps and cholesterol in the system. The blood showed an increase of indican and of acetone bodies, the former implying destruction of tryptophan, of which it is a decomposition product. These changes, the writers believe, may act prejudicially on the body ferments, thereby upsetting protein anabolism and katabolism.

In a study of many drunkards of the dipsomaniac type, S. D. Ludlum and E. McDonald (Med. Jour. and Rec., Mar. 2, 1927) found that *alcohol hunger* is marked by activity of gastric peristalsis, increased smooth muscle reaction, vagus preponderance, and aggregation or coalescence of the colloid particles of the blood plasma. The gastric activity noted is akin to Carlson's hunger pains. The condition is quite different from morphine hunger, which is characterized by sympathetic preponderance, decreased smooth muscle reaction, dilatation of the stomach and large intestine (sympathetic effects), and dispersion of the colloid particles under the dark field. Thus, alcohol desire is de-

pendent upon profound chemical changes in the body. It may be relieved by minor percentages of alcohol as well as by the stronger dilutions. After indulgence, the blood plasma hydrogen ion concentration of the periodical alcoholic is upon the alkaline side of normal.

A case of alcoholic *multiple neuritis* and *Korsakoff's syndrome* in a pregnant woman is reported by B. Weill-Hallé and F. Layani (Bull. Soc. méd. des hôp. de Paris, Feb. 17, 1927). The woman of 37, who had had exophthalmic goiter from a fright during the war, was first seen in 1925 when 3 months' pregnant, having had repeated vomiting for about a month. She had been taking 2 or 3 glasses of port wine daily for 5 years, together with  $\frac{1}{2}$  liter of other wine at each meal. Suddenly, in the hospital, mental and then neuritic manifestations set in. Recent events were forgotten, knowledge of the time, day and year lost, and there was anxious groping for objects in her possession only a few minutes before. The patient recognized her mistakes when her attention was called to them, but insisted on an unbroken connection between her present stay in the hospital and an admission there 5 years before for pleurisy. She looked upon the personnel as old relations and built up imaginary family groups, which remained fixed in her mind for a long period. Coupled with this rather distinct Korsakoff syndrome was an apparent mental lucidity and adequately logical conversation when she was first spoken to. Memory of long past events was retained. These mental disturbances had existed for 10 or 15 days when an extensive multiple neuritis set in, with gradual amyotrophy in the lower extremities and sphincteric incontinence. The Wassermann was negative. There was no improvement until after the delivery of a healthy infant, whereupon both the mental and neuritic phenomena underwent subsidence, the former

rapidly and the latter gradually. In connection with this case it is of interest to recollect that Korsakoff's own first case was in a puerpera. In the present patient the latent alcoholic intoxication is thought to have been a factor in conjunction with the intoxication of pregnancy. The former exophthalmic goiter is also to be kept in mind.

In a case of severe alcoholic neuritis recorded by Warfield (Ann. of Clin. Med., Mar., 1927), the condition was coupled with multiple symmetrical gangrenous areas involving the abdominal subcutaneous skin and fat. There was also adiposity, pituitary disturbance, and a moderate hypertension.

**TREATMENT.**—Inhalation of oxygen was observed by W. Palthe (Deut. Zeit. f. Nerv., July, 1926) in several persons to exert a powerful antagonistic action on the toxic effects of alcohol. In rabbits he found it possible to counteract a lethal dose of it by oxygen inhalation. The symptoms were attenuated by the procedure, though not wholly abolished.

In 2 cases of *delirium tremens* oxygen acted very favorably on the motor and mental symptoms. Further clinical tests of the measure are recommended.

P. Bousfield (Lancet, Nov. 28, 1925) notes that the individual approaching a physician for treatment of his alcoholic craving nearly always does so at a time when he is almost without any control of the habit, *i.e.*, either during a drinking bout or in an exacerbation of his chronic state. The alcohol should, as a rule, be reduced and left off after 2 days' treatment, though sometimes it is better stopped at once.

The patient should preferably be placed in a nursing home for 4 to 7 days. If gastritis and general malaise

are very bad, it is well for him to remain in bed for 24 or 48 hours. Cheerful companionship is a great accessory.

Where the patient's condition is very bad, and the stomach loaded with alcohol,  $\frac{1}{10}$  grain (0.0065 Gm.) of **apomorphine hydrochloride** should be given hypodermically, if the heart be in fair condition. Further doses,  $\frac{1}{30}$  grain (0.0022 Gm.) to  $\frac{1}{20}$  grain (0.0032 Gm.) may be given at intervals of 6 to 8 hours, with one of these doses just before retiring. On the second day a small dose may be given in the morning and another at bedtime.

These small doses rarely induce vomiting. If they do, **hyoscyamine sulphate** followed by a full dose of **potassium bromide** is an excellent combination.

As a general tonic and to reduce the craving for alcohol, the following mixture is to be given every 2½ to 3 hours, 6 times daily:

℞ *Liq. atropinæ*  
*sulph.* (B.P.) ..  $\text{m}\frac{1}{4}$  (0.015 c.c.);  
*Liq. strychninæ*  
 (B.P.) .....  $\text{m}j$  (0.06 c.c.);  
*Tr. cinchonæ*  
*comp.*,  
*Glycerini*, .....  $\text{f}\text{ss}$  (2 c.c.);  
*Inf. gent. comp.*,  
 q. s. ad .....  $\text{f}\text{ss}$  (15 c.c.).—M.

After 4 days this should be discontinued and 1 dram (4 c.c.) of the following given 2-hourly in a wineglass of water:

℞ *Fl. ext. cascariæ* .  $\text{m}x$  (0.6 c.c.);  
*Tr. cinchonæ*  
*comp.* .....  $\text{f}\text{ss}$  (2 c.c.);  
*Aloini* ..... gr.  $\frac{1}{6}$  (0.004 Gm.);  
*Liq. strychn. hydrochlor.* (B.P.)  $\text{m}iij$  (0.2 c.c.);  
*Inf. gent. comp.*,  
 q. s. ad .....  $\text{f}\text{ss}$  (4 c.c.).—M.

This may well be changed after a week to the following:



℞ *Fl. ext. cascaræ*... ℥iij (0.2 c.c.);  
*Aloini* ..... gr.  $\frac{1}{16}$  (0.004 Gm.);  
*Tr. cinchonæ*  
*comp.* ..... f3ss (2 c.c.);  
*Inf. quassiæ* (1-7) ℥viiss (0.45 c.c.);  
*Inf. gent. comp.*,  
 q. s. ad ..... f3j (4 c.c.).—M.

An empiric measure consists in giving 2 c.c. (32 minims) per diem of isotonic colloidal gold. Clinical tests have convinced the writer of its value. The daily dose should be divided into 3 parts and given after each meal. It should be started at once and continued for 3 weeks.

After the first 4 or 5 days the actual desire for alcohol has ceased, but the fear of the desire does not disappear until experience has shown the patient how easy it is to abstain. If at this stage the patient is solemnly warned not to touch alcohol again under any circumstances a fair proportion will be freed from its slavery.

A much greater percentage of permanent cures is established when to the physical treatment is added some form of **psychotherapy**. Most cases suffer from what may be termed a series of normal tensions, which can be fairly rapidly brought to light by a minute examination into the history of the patient's alcoholism, including an inquiry into the various emotional states of his mind which were present on various occasions when alcohol was taken.

In the type of case that drinks in order to abolish the fear of drinking, the patient should be daily impressed by the physician with the needlessness of his fear, and the fact that if he could eliminate his desire for it in a few days in a nursing home he can certainly do the same for himself on any future occasion. In many

cases the patient is in a position to cure himself by taking a week-end holiday of 3 days with a suitable companion. He knows that if he can put behind him for a short period the tensions of home life and business he can overcome, without a physician, the gastric tension and general malaise which promote continuation of a drinking bout. A frequent cause of the beginning of a bout in minor relapses is undischarged sexual tension.

The extreme motor restlessness in *delirium tremens* is instantly allayed, according to the experiences of L. Ramond, A. Laporte and N. Quénée (Bull. Soc. méd. des hôp. de Paris, May 20, 1926) in 8 cases, by an intravenous injection of 5 to 6 c.c. (80 to 96 minims) of **somnifen**. The patients are thrown into a deep sleep for some hours, and upon waking they are permanently freed of their delirium. The injections are non-toxic. The product is injected undiluted and very slowly. The writers met with no difficulty in administering the injection in these restless patients; the arm was held by an assistant and the patient, spoken to in a firm manner, kept quiet long enough to permit of carrying out the procedure. No other sedative drug was used.

**THERAPEUTICS.**—Discussing the value of alcohol in old age, O. T. Osborne (Med. Jour. and Rec., Dec. 3, 1924) observes that a little alcohol acts as a gentle narcotic to the brain, dilates the peripheral vessels, gives a feeling of surface warmth and warmth to the extremities, depletes the internal congestion areas, often starts a failing appetite, quiets an irritable heart, and gives a general feeling of comfort. It has a positive food value, and if sugar is added (unless

contraindicated) a food is furnished that readily oxidizes and is of benefit to old people. On the other hand, alcohol as a heart stimulant in shock is of no value.

C. Willcox (Va. Med. Mthly., Sept., 1926) states that alcohol should not be prescribed as a placebo; in robust adults unless conditions are alarming; in epileptics, nor in acute gastritis, hepatitis, or nephritis, as a rule. Locally, its use as a gargle has been reported favorably for prophylaxis during exposure to infections of the upper respiratory tract. It is a good substitute for mercurochrome or tincture of iodine, when these are not available, for the **cleansing of wounds**. It is soothing and beneficial as a "rub" where the skin is hot and dry, and nothing excels it as a **preventive of bedsores**. In its internal use, the exact rate of its oxidation in the system should be remembered, *viz.*, 10 c.c. of absolute alcohol per hour in the average-sized adult. Hence the advisability of giving it, therapeutically, in small doses and well diluted. Only in **painful flatulence** should strong spirits, preferably brandy, be given without dilution. In collapse in the **summer diarrhea** of babies, good results follow brandy in small, frequently repeated doses. Some children with **pneumonia** have, in the author's experience, been tided over critical periods by it. In **Asiatic cholera** with extreme dehydration he had good results in some apparently hopeless cases with frequent doses of whisky or brandy, well diluted. In selected cases of **pneumonia**, alcohol is invaluable; in some, occurring in alcoholics, it is mandatory. Generally it is beneficial in **septic cases**, surgical or medical. Men after hard

labor often suffer from severe cramps if they quench their thirst with pure water; there is a great loss of body salts through the sweat, and water alone causes a mild poisoning. When cider, beer or diluted wine is used instead, these cramps do not occur. Nausea, especially in **seasickness**, is often relieved and even cured by alcohol, preferably in the form of champagne, brandy or benedictine. Nothing can replace alcohol in relieving the worry, distress and anxiety of patients and giving them a feeling of repose and well-being which plays a vital part in helping them over a crisis or rendering suffering more bearable.

As a substitute for protein therapy, Spiethoff (Münch. med. Woch., July 8, 1927), in **inflammatory states** with a tendency to breaking down of tissue, injects intramuscularly twice a week, 0.05 to 0.1 c.c. ( $\frac{3}{4}$  to  $1\frac{1}{2}$  minims) of alcohol, diluted 1:2 or 1:5. Good effects are reported. Among other cases in which the measure was tried with success was one of **frequent pollutions**.

Alcohol injections into nerve tissues for the relief of **pain** in various situations are strongly advocated by G. I. Swetlow (Amer. Jour. Med. Sci., Mar., 1926). Whereas injection of 80 per cent. alcohol into a peripheral nerve destroys both the sensory and motor components, 60 per cent. alcohol produces only slight transitory motor weakness. For **laryngeal pain** in **pulmonary tuberculosis**, the writer injects the superior laryngeal nerve on the most painful side with 2 c.c. (32 minims) of warm 60 per cent. alcohol containing 1 per cent. of cocaine hydrochloride. The alcohol must be injected directly into the nerve, the thyrohyoid

area being probed lightly and patiently until the nerve is met. Of 13 cases treated, in 1 there was failure to strike the nerve, 8 were completely relieved for 22 to 96 days (to date), while 4, though relieved of pain, had difficulty in "pushing the food down." Nearly all complained of immediate motor difficulty in swallowing, but most of them cleared up in a few days. Twelve had increased local pain, lasting at most 2 days, previous to relief. In severe **pleuritic pain** in tuberculosis, the writer procured relief in 5 cases by injecting the intercostal nerves whose skin areas were found hyperalgesic to pin-prick. The injections were made 4 cm. from the midline posteriorly.

Three cases of severe **headache** were treated, with relief for 10 to 12 weeks to date, by alcohol injection of the great occipital or supraorbital nerve. In a case of severe **tabetic gastric crises**, paravertebral injection of alcohol into the roots of the 4th, 6th and 8th dorsal segments on the right side and of the 3d, 5th and 7th on the left resulted in complete relief for 49 days to date. In a case of **cardiac pain** due to **aortitis** in a congenitally syphilitic female of 20 years, paravertebral injection of the 4th to the 7th dorsal roots on the left side gave pronounced relief. Lastly, in a case of **pruritus ani**, unrelieved by an epidural injection of procaine in saline solution, epidural injection of 20 per cent. alcohol in saline solution to make 75 c.c. (2½ ounces) brought immediate relief.

**METHYL ALCOHOL.**—Little on this subject has appeared in the literature of late. C. Egg (Schweiz. med. Woch., Jan. 1, 1927) points out that a serious danger in the ingestion of methyl alcohol is that, because its

narcotic action is less than that of ethyl alcohol, more of it is likely to be consumed. Being only with difficulty destroyed in the system, it behaves like an inorganic poison. A complex compound is formed by methyl alcohol with ferrous salts, the catalytic action of which on oxidation is thereby arrested.

#### **ALOPECIA. — ETIOLOGY. —**

The relationship of *syphilitic alopecia* to neurosyphilis has been investigated by U. J. Wile and G. H. Belote (Arch. of Derm. and Syph., Apr., 1926) in 37 cases. The frequent association of alopecia and cerebrospinal involvement was confirmed. Alopecia in syphilis must be divided into 2 groups, the essential cases, numbering 30 in this series, and those in which the loss of hair is associated with local papular lesions, numbering 7. Of the former, a large majority showed syphilitic changes in the spinal fluid, while of the latter, only 2 showed slight, questionable changes. The essential type yields a negative histologic picture, while in the second group of cases there was always a perivascular and perifollicular syphilitic plasmoma. In this latter group the loss of hair is thus attributable to pressure atrophy or to local effects of spirochetes or their toxins. In the essential type the alopecia is rather the result of temporary interference with general hair growth, the neurosyphilis probably producing a profound disturbance of the autonomic nervous system and endocrine glands. Thinning or loss of hair, as is well known, is frequently seen in hyperthyroidism, disturbances of ovarian or testicular secretion, pregnancy, and castration.

In 1 of 3 cases of *generalized alopecia* reported by G. Wilson and N. W. Winkelman (Jour. Amer. Med. Assoc., May 8, 1926), the condition came on 1 year after a complete hysterectomy, with coincident occurrence of symptoms of brain tumor. The alopecia was here ascribed, not to the ovariectomy, but to the tumor, which was situated directly over the pituitary, suggesting a disturbance of function in this region.

In the second case the alopecia came on after a severe emotional stress, and there were likewise symptoms referable to the pituitary region. In the third case no plausible cause was unearthed.

Coincident occurrence of *alopecia areata* and *lupus erythematosus* is discussed by M. G. Hannay (Lancet, Nov. 29, 1924). Toxins of various kinds being thought possible causes of both affections, a common factor exists, and it is not surprising to find the 2 coexisting in the same patient. In a woman of 32 years, the occurrence of *lupus erythematosus* on the face was followed 2 years later by the appearance of *alopecia areata*, rapidly extending until over  $\frac{1}{2}$  of the scalp was completely bald. Cultures from the mouth, nasopharynx and feces yielded growths of *staphylococcus*, *streptococcus* and *colon bacillus*, from which a **vaccine** was prepared. Weekly injections were given. Three months later, hair had begun to grow in all the patches; it continued to grow rapidly and did not fall out again. The *lupus erythematosus* at the same time markedly improved, though it did not completely disappear. Several cases of *lupus erythematosus* associated with total alopecia are on record.

**TREATMENT.**—**Thyroid** was used successfully by Léopold-Lévi (Paris méd., Oct. 1, 1927) in the case of a woman aged 37 who had gradually become almost completely bald. Small doses of the drug being given, from the second week the hair began to stop falling out, and eventually recovery was complete. The case supports the view advanced by the writer in 1907 regarding the action of the thyroid gland on the growth of the hair.

According to Bonjour (Presse méd., Dec. 16, 1925), *alopecia arcata* is sometimes curable by **suggestion**. He reports 4 cases. A woman, neurasthenic since 15 years, and having had *alopecia areata*, uninfluenced by various treatments, for some years, was cured by suggestion in 6 weeks both of her neurasthenic symptoms (asthenia, marked dyspepsia and insomnia) and alopecia. Case II had had about 12 patches of alopecia for several months, and was also suffering from mental depression. She received codeine for the mental depression and weekly suggestion for the alopecia, which was cured in 6 weeks. The mental depression passed off. She also had had pleurisy, rheumatoid pains and furunculosis, the latter persisting after recovery from the alopecia. Case III had a single patch of alopecia, together with high blood-pressure, heart pains and palpitations. Under weekly suggestion hair began to grow at the periphery of the patch in 1 week and the patch was covered with hair in 1 month. The circulatory disturbances persisted in spite of suitable treatment. In both of these cases the loss of hair was checked on the 1st day of suggestive treatment. Objective evidence was



obtained by weighing the hair lost from the entire scalp. In Case II the daily loss of hair dropped from 0.8 Gm. on the 1st day of treatment to 0.15 on the 7th day; in Case III, from 0.29 Gm. to 0.06 Gm. A woman with long hair normally loses 0.5 Gm. of hair a week. In Case II the weekly loss of hair dropped from 2.75 Gm. in the 1st week of treatment to 0.59 Gm. in the 7th week; in Case III, from 0.69 Gm. to 0.46 Gm. Case IV, still under treatment, was one of total alopecia of 12 years' standing, never improved by any measure; under suggestion, hairs up to 1 cm. in length covered over the previously quite glabrous scalp. Apparently, alopecia can be cured through nervous influences and despite persistence of poor health in other respects.

**ALUMINUM.—UNTOWARD EFFECTS.**—H. A. McGuigan (Jour. of Lab. and Clin. Med., May, 1927) notes that carbonate of soda attacks aluminum freely, and it is well to exclude carbonate or bicarbonate from all aluminum cooking utensils. In dogs, he found the toxic dose when molecular solutions were injected intravenously to be, for aluminum potassium sulphate, 0.2 Gm. per kilo., and for aluminum chloride, 0.234 Gm. per kilo. In man, Chittenden, Taylor and Long had found that aluminum compounds furnished in foods up to 0.15 Gm. a day for several months were without influence on health. Blyth figured the lethal dose of aluminum for a man of 68 kilos. (150 lbs.) to be about 17 Gm., corresponding to about 3 ounces of ammonium alum. When aluminum is taken by mouth in moderate amounts, there is little danger of toxic effect because only traces are absorbed. There is no excuse for its use hypodermically, and it is only when thus used that it is of toxic importance.

Danger attending the use of a wet dressing of aluminum acetate for too long a time is pointed out by Hertzler (Amer. Jour. of Surg., June, 1927). To a finger

with infection extending only to the subcutaneous tissue, a solution of aluminum acetate, 30 grains (2 Gm.) to a pint of water, was applied. A week later, the skin on the dorsal surface was badly macerated, and the index finger was black as far as the base of the second phalanx. Amputation was done at the metacarpophalangeal joint. Microscopic examination showed an endarteritis and complete thrombosis of the veins. Generally speaking, all will be accomplished in 24 hours that can be accomplished with this drug and, when prescribed, a limitation should be placed on its use. The same general rule applies to any wet dressing.

**THERAPEUTICS.**—The use of a potassium and aluminum nitrate poultice of oatmeal, as advocated by Thorek (Ill. Med. Jour., Aug., 1925), has been found helpful by E. J. Sawyer (Boston Med. and Surg. Jour., Aug. 12, 1926) in selected cases, of which he reports 4. Case I was one of injury to the thumb with a hammer, with infection suggesting a lymphangitis. The poultice was applied for 24 hours, after which an area of sepsis appeared, and an incision encountering pus was made. After another day of poulticing only a serous discharge remained. In Case II a piece of brass wire had entered the thumb 3 weeks previously. Localization of the infection was accelerated by 72 hours of poulticing and the area for exact incision was outlined, rapid healing following. Case III was one of indolent varicose ulcer. Granulation was stimulated by applying a poultice of reduced strength often enough to keep up a mild hyperemic irritation. In Case IV, with a small draining sinus of the tibia, 72 hours of poulticing produced a profuse discharge with marked reaction and extrusion of a sequestrum in 24 hours more. After further poulticing and alcohol dressings, the sinus closed.

**AMAUROSIS.**—A form of congenital amaurosis unattended with any apparent changes in the eye, or any ophthalmoscopic lesion, but in which some visual power, albeit always subnormal, becomes established at about the 7th month of life, is described by

Bretagne (Médecine, Jan., 1927). The diagnosis in the early months is made by the complete instability of the eyes, which may be directed upward or the seat of incessant, incoordinate lateral movements. The child fails to be attracted by a window or artificial light, but the light reflex is normal or scarcely diminished. The visual defect is associated with signs of physical and mental debility. These cases should not be confounded with those of blindness from congenital cataract or leukoma, or with temporary blindness due to meningeal disease. The histologic lesions are evidently located somewhere in the optic tracts or cortical visual centers. These children show low resistance to infantile diseases. No serviceable treatment is known, though **antisyphilitic treatment** should be tried in view of the possibility of inherited syphilis.

L. Genet (Arch. de méd. des enf., Apr., 1927) likewise discusses blindness without retinal lesions in infants and small children. The causal diagnosis is extremely difficult. Epidemic encephalitis in its attenuated forms should be considered as an etiologic factor. Treatment should be directed against this disorder in some of the cases, and **methenamine** administered. Two of the writer's cases recovered, while in others blindness still existed after 8 months.

Three cases of progressive *retrobulbar amaurosis* are reported by J. Wolff and J. H. Globus (Arch. of Ophth., Nov., 1927). In none were there evidences of a localizable, expansile intracranial lesion or of increased intracranial pressure. Central scotomas developed and widened progressively, leading to almost com-

plete loss of vision. Visual field changes of the nature of hemianopsia were observed. No treatment proved of value except **typhoid vaccine injections**, under which complete or almost complete restoration of vision occurred.

Coyon, Cerise and Clog (Bull. Soc. méd. des hôp. de Paris, Jan. 27, 1927) report a case of amaurosis following a severe *gastrointestinal hemorrhage*, probably due to duodenal ulcer, in a man of 22. The blood issuing from the bowel filled a toilet jar  $\frac{3}{4}$  full, and that soon after emitted from the stomach, over  $\frac{1}{2}$  of a washbowl. Next day, a smaller quantity of blood was lost through the bowel. Under repeated blood transfusions the blood condition improved, but one week after the initial copious hemorrhage, vision became indistinct, and was completely lost the next day. There was extreme pupillary dilatation, absence of light reflex, and extreme pallor of the retina. Six weeks later restoration of vision was limited to the external part of the fields, with complete loss of macular vision. Inhalations of **amyl nitrite** had been given from the start and followed by small doses of **strychnine**. This type of amaurosis occurs rarely after alimentary tract hemorrhage, metrorrhagia or epistaxis, and even much more rarely from hemoptysis, hematuria, or surgical hemorrhages.

In a primary school for the blind in Mexico City, the teaching of reading and writing to blind children is very satisfactorily carried out, according to D. M. Vélez (An. Soc. Mex. de Oft., Dec., 1925) by the use of large letters of the ordinary type (not Braille) outlined by series of brass clips, such as are commonly used to fasten together legal documents. For a large letter A, 14 such clips are used. With the left thumb and forefinger forming a frame of the same size as the letter, the child

readily learns to reproduce each letter on paper, and thus acquires the ability to communicate with other persons in writing.

**AMBARD CONSTANT.**—According to J. Goldberger (Jour. d'urol., Nov., 1926), changes in the cardiovascular system or the endocrin glands influence the urinary output of urea, and it is when these extrarenal factors are excluded that a high Ambard constant indicates disturbed excretion of urea due to kidney insufficiency. This applies in uremic nephritis or mixed forms of nephritis. Accordingly, Ambard's constant is particularly significant in surgical disorders of the kidneys, in which the forms of nephritis just alluded to are common. E. Christian (*ibid.*, June, 1926) deprecates too implicit reliance on the Ambard ureosecretory constant, and deems it a trustworthy index only in cases of operation on the bladder and ureter.

**AMBLYOPIA.**—A. Cantonnet (Paris méd., Sept. 4, 1926) emphasizes the fact that a unilateral amblyopia may escape notice for long periods, even years. Such may be the case, for example, in latent strabismus. Again, a young man, shooting, found that he could not see the target clearly; on examination, an atrophic area of chorioretinitis at the macula lutea was noted. A dressmaker noticed she had trouble threading a needle; examination revealed a developing sarcoma of the choroid. A boxer received a blow in the eye; some time later, rubbing the other eye because of some local irritation there, he noticed he could not see out of the eye which had sustained the blow; examination showed detachment of the retina. An old man, knocked over by a cyclist, struck his orbital margin on a trolley-car rail; later, while engaged in his occupation of painting, he closed one

eye and found that the other was blind; a fissure of the orbit involving the optic foramen had induced total optic atrophy on that side. A physician, entering his garage at night, struck his forehead against a ladder which the gardener had left in the way; some days later, happening to close one eye, he noticed a blank area in the middle of the visual field of the other eye; a central scotoma had developed, due to orbital fracture and lesion of the macular bundle. After eclipses of the sun, oculists are consulted by patients complaining of poor vision in one eye, frequently with the result that an old, unrecognized amblyopia of one eye is found. Thus, in examining a patient complaining of poor vision in one eye since a certain day, the practitioner should make a mental reservation to the effect that it was on that day that the patient *first noticed* the difficulty, which, on examination, may be found to have obviously existed a long time before.

**AMENORRHEA.**—The *pituitary* form of amenorrhea is stressed and discussed by Klasten (Mon. f. Geb. u. Gyn., July, 1926). In such cases return of menstruation occurred under **pituitary** medication together with **diathermy** of the genital organs. In 1 case, symptoms of a pituitary tumor accompanied the amenorrhea.

F. Parkes Weber (Brit. Jour. of Derm., Jan., 1926) has reported a case of amenorrhea with cutaneous striae, purpura, high blood-pressure and obesity, of the type sometimes connected with cortical tumors of the adrenals, but occurring in the absence of any such tumor. The patient died in an attack resembling acute pulmonary edema. A small

basophile adenoma of the pituitary was found at autopsy, but this did not seem adequate to account for the clinical manifestations.

Habitual amenorrhea was found associated with sterility by I. C. Rubin (Amer. Jour. of Obst. and Gyn., July, 1926) in 74 out of 1450 instances of sterility, *i.e.*, about 5 per cent. Pregnancy takes place in only about 5.5 per cent. of the untreated cases, but in 9 out of 12 (75 per cent.) cases treated with mild doses of X-ray, pregnancy resulted. Eight out of these 9 cases went to full term and gave birth to normal children. X-ray irradiation of the ovaries resulted in restoration of the menses in 11 out of 12 cases of amenorrhea. Irradiation of the pituitary area and of the thyroid appears to have adjuvant value. Two of the pregnant and 2 of the non-pregnant women received pituitary irradiation, and 1 pregnant woman also thyroid irradiation. **Per-uterine tubal insufflation** and **endocrin therapy** are additional aids to the therapeutic action of the X-rays in amenorrhea associated with sterility.

As the ovaries were found definitely enlarged before treatment in 8 of the 9 successful cases treated with X-rays, careful examination as to this point may prove of aid in selecting the cases of amenorrhea associated with sterility suitable for ovarian stimulation. When no ovarian enlargement is found, irradiation of the pituitary area or the thyroid, etc., may be more advisable and should certainly precede irradiation of the ovaries.

**AMIDOPYRINE.**—The action of this drug on the uterus and spermatocord of rats and guinea-pigs has been studied by Lasch and Perutz (Arch. f. Derm. u. Syph., July 1, 1926). It was found to

diminish tonus and exert a quieting effect on these organs. It was concluded, therefore, that the clinical effect of amidopyrine on the smooth muscle of the genital tract is not only central but also peripheral.

**AMNESIA.**—The occurrence of a *preclamptic amnesia* is pointed out by J. Hewitt (Glasgow Med. Jour., July, 1927). About 20 per cent. of patients with eclampsia could not recall the happenings of the days immediately preceding the onset of the convulsions. No one detected, however, any mental impairment during this period, and the patients could execute reasoned actions. The obliteration of memory referred to is permanent, may concern events that took place months before the eclampsia, and is independent of the number of convulsive seizures, degree of coma, blood-pressure, and amount of albumin in the urine.

An unusual case of amnesia with *dual personality* has been reported by Alfred Gordon (Med. Jour. and Rec., July 7, 1926). He notes that with few exceptions all the cases of double or multiple consciousness recorded in the literature present 2 characteristic features: (1) At no special time is there a simultaneous existence of the 2 egos; (2) at first there is total amnesia; one personality is unconscious of another; later, with or without treatment the gap separating the dissociated mental states gradually gets narrower or fills up. In the writer's case, however, there was no tendency towards filling the gap. The patient, a woman of 25 years, was totally unable to recall any occurrences that had taken place during an entire year, and this inability still existed 1½ years after the return of her normal personality. In the 2



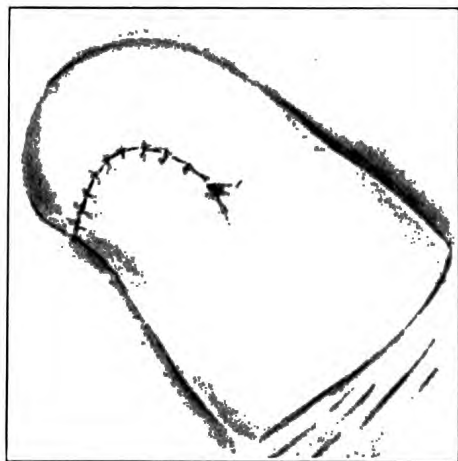
years preceding the unrecalled period her disposition had changed. During the unrecalled year she was married. Shortly before the restoration to normal personality she had a fall, and was considerably confused and frightened. At the moment of restoration of normal personality she was surprised to find the husband in her bed, not recalling that she had married him. Her history since childhood showed her to be a psychoneurotic. There had been a conflict between her desire for self-expression and the sense of duty towards her parents. The amnesia is regarded as having been the expression of a neurotic mechanism set in motion in order to carry out the urge of the subconscious forces, *i.e.*, lead the life of a personality that was real and desirable to her. As she is at present compelled to continue living with her parents, the repression persists and she may again become amnesic. The treatment of such cases should aim not only at adaptation to their environment but also at adaptation to themselves. They must be shown how to unravel the complex psychologic states which are in constant conflict so as to fit them to face their personal problems.

A. Sterling (*ibid.*, May 5, 1926) reports a case of amnesia following 6 weeks after the onset of *encephalitis lethargica*. The man knew no one by name, nor anything about his past or present; could not remember names, even of his immediate family, nor the faces of visitors. He did not know that he was in a hospital, nor where he worked, and did not have any shame or fear. He knew his own name and could read newspapers and magazines, but did not know what he was reading. He always made an

attempt at conversation, but it was illogical and incoherent. On the porch, the scenery and sights had no effect upon his memory.

**AMPUTATIONS.**—A new selective point for amputation of the *index finger* is recommended by S. J. O'Brien (Ill. Med. Jour., Aug., 1927). When it is necessary to amputate at or between the 2d phalanx and the 2d metacarpal bone, the amputation should be done at the center of the middle third of the 2d *metacarpal* bone, when the hand is otherwise normal. This method is preferable to the classical operation by reason of greater restoration of function and greater strength, sensitiveness and usefulness, a better cosmetic result, and a more easily performed operation, in a clean field, without complicated anatomy. The accepted rule of saving every bit of length of the finger often results in a member which is almost useless. Reamputations have been frequent in these cases, because of a tight scar across the bone, usually painful, or infection and ulceration from tension, etc. In the operation advised, the incision is carried as far as the middle third of the 2d metacarpal. Retraction exposes the 1st dorsal interosseous, which is severed at its insertion on the 1st phalanx. The incision is completed in the form of Malgaigne's racket—somewhat Y-shaped, with its long arm on the dorsal surface. The soft parts having been separated, the metacarpal is severed, care being taken not to injure the palmar arch. The tendons are exposed and severed; the 1st dorsal interosseous tendon is sutured with silk to the 2d dorsal interosseous at its insertion. This operation be-

ing performed without inflammation, limitation of motion is obviated. Index finger stumps lose some of their tactile sense, whereas removal of the finger with part of the metacarpal bone permits the middle finger to take on the activities of the index finger to such an extent that the hand shows no apparent loss of function. Absence of the stub permits of performing practically every kind of labor, and the hand is shown by the dynamometer to have actually greater



"Baseball cover flaps."  
(Orr, in *Surg., Gyn. and Obst.*)

strength than its unoperated fellow. From the standpoint of compensation to workers, the new method is less expensive than the old, because of the absence of complications subsequent to the first operation.

Two cases of *interscapulothoracic amputation* for advanced mammary cancer are reported by C. Wallace (*Brit. Jour. of Surg.*, July, 1925). In such cases the union must be at the sternum, as it is necessary to sacrifice the anterior flap, which contains the tumor. Easy coaptation was obtained thus: The incision started over the mastoid, about 3 inches above the clavicle, passed down to and over the

sternoclavicular joint; it then turned out 2 inches below the clavicle, crossed about 2 inches above the angle formed by the junction of the skin of the chest and the arm; then across the deltoid, sloping slightly down to where the posterior aspect of the arm joins the body, and next back and down almost to the angle of the scapula. Here it turned forward, crossed the axilla horizontally below the mamma, and reached the sternal margin, which was followed up to the clavicle. Upon turning the superior flap up, it was easy to divide the muscles on the scapula, turn the upper limb forward, and detach it from the thorax. The arm, scapula, pectoral muscles and mamma were then removed in one block. The shock resulting was no greater than in many ordinary breast operations.

In *disarticulation at the hip* for large malignant growths, according to M. Perret (*Schweiz. med. Woch.*, May 15, 1926), the mortality is unnecessarily high because of the hemorrhage, which the weakened patients cannot withstand. For this reason he advocates the *Trendelenburg position* and *ligation of the common iliac* just before the disarticulation. Through a small incision below the umbilicus, 2 ligatures of doubled large catgut are placed  $1\frac{1}{2}$  cm. ( $\frac{3}{8}$  in.) apart on the distal half of the common iliac. During closure of the wound, all the blood in the limb flows back into the trunk. An incision is then made in Scarpa's triangle to cut the femoral vessels between ligatures, and through the same incision the bloodless limb is disarticulated. In 2 cases thus dealt with, the operation was well borne and primary healing occurred.

In *leg and thigh amputations*, T. G. Orr (*Surg., Gyn. and Obst.*, June, 1927) advocates the preparation of "*baseball cover flaps*," which permit

closure without the redundant skin, puckering and easily irritated irregularities common with other flaps. The sum of the length of the flaps should, as usual, equal  $1\frac{1}{2}$  times the diameter of the extremity. The measurements should be made from the site of bone section. This is easily done with a piece of catgut by taking  $\frac{1}{2}$  of the circumference, which is about  $1\frac{1}{2}$  times the diameter. The posterior flap should be short and not dissected from the muscle, except enough to permit of easy suturing to the anterior flap. The deep fascia should be raised with the skin flap and always carefully closed. This method can be used whenever sufficient skin for the flaps is available, no active infection exists, and the circulation is not greatly impaired.

Zur Verth (Zent. f. Chir., Nov. 27, 1926) objects to the long Gritti stump in amputation of the *thigh*. The stump should be 6 to 8 cm. ( $2\frac{2}{5}$  to  $3\frac{1}{5}$  in.) shorter than the thigh of the opposite side, otherwise the knee of the artificial limb will be at a lower level than that of the normal extremity.

Control of the femoral artery by **Crile's clamp** in *thigh* amputations is recommended by C. E. Corlette (Med. Jour. of Austral., Sept. 10, 1927). A small incision over the common femoral artery is made for the purpose. After the limb has been removed the clamp is gradually loosened, and later tightened again if required, while hemostasis in the wound is attended to in the usual way. Finally the clamp is removed and the little incision sutured. In a case described, in which ether anesthesia was used, the femoral nerve was, in addition, blocked through the small incision

by injection of 2 c.c. (32 minims) of 2 per cent. **procaine** solution into it. Likewise, in the amputation, when the sciatic nerve was exposed, it was separated up for some distance and the same amount of procaine injected into it. Later the nerve was cut, distal to the injection. With these procedures, practically no blood was lost and there was no sign of shock at any time. Two other thigh amputations were similarly performed with equal success. Where spinal anesthesia is used, the writer advocates injection of the anesthetic solution no higher than between the 3d and 4th lumbar, with added infiltration over Scarpa's triangle with a local anesthetic for the small incision, since sensation from this area reaches the cord above the level of the lumbar injection.

Discussing the various methods of amputation and exarticulation in the region of the *foot*, G. Magnus (50 Tag. d. deut. Ges. f. Chir., 1926; Surg., Gyn. and Obst., Mar., 1927) states that in a German hospital the Pirogoff operation is now performed somewhat oftener than the Chopart or Lisfranc. He regards it as the best type of amputation, having performed it lately with good end-results in 18 cases, including a few in which the other types of operation had previously been carried out. He used the old Pirogoff incision and dispensed with nailing and drainage. The patient was allowed to get up with a plaster cast after 4 weeks. Greater comfort to the patient attends the Pirogoff than the other operations--- The Lisfranc is feasible only when there will be no tension on the stump on closure of the soft parts, while the Chopart is unfavorable because the

foot tends to assume the *pes equinus* position. In the cases treated by the writer in the last 9 years, reamputation after the Pirogoff became necessary only once. Zur Verth (*ibid.*) is less disposed to favor the Pirogoff than Magnus. Constitutional factors not always determinable beforehand play a part in the healing of the bone. Men subjected to the Pirogoff during the war have been increasingly complaining of a progressive difficulty in walking. There is as yet no good prosthesis for the Pirogoff stump. Conditions are best when the stump is so short that a joint may be placed below it.

**The Amputation Stump.**—P. N. Jepson (Boston Med. and Surg. Jour., Apr. 14, 1927), dealing with the *post-operative treatment* of stumps as practised at the Mayo Clinic, notes that amputation through the *tarsal bones* is unsatisfactory. He is not in favor of the Pirogoff and seldom, of the Chopart. Surgeons on the whole are in favor of Syme's amputation, while the limb-makers almost unanimously condemn it, stating that the stump is hard to fit with an artificial limb and that 80 per cent. of all the patients undergo reamputation. In the *leg*, a stump measuring 17.5 cm. (7 inches) from the lower edge of the patella is ideal. In stumps shorter than 15 cm. (6 in.) the fibula should be removed entirely.

With reference to the *thigh*, perhaps the ideal operation is the Gritti-Stokes, in which the femur is divided through the upper part of the supracondylar ridges and the superficial  $\frac{1}{2}$  of the patella nailed or sutured over the cut end of the bone. Above the level of this operation, the rule is to save as long a stump as possible.

Early amputation of the *hand* or any part of it should be undertaken only as a life-saving measure. Occasionally one digit may be transplanted to function as a thumb, and to serve much more satisfactorily than an artificial hand. In amputation of *fingers* long palmar flaps should be used and the nerves cut short and allowed to drop back. The ideal site for amputation of the *forearm* is between the middle and lower thirds. If conditions will not permit a stump of the forearm of useful length, the amputation should be carried out 2.5 cm. (1 in.) above the elbow. Above this, every centimeter possible, consistent with a good flap, should be saved.

Immediately after operation the stump should be controlled to prevent flexion deformity. Below the knee, a **posterior splint** may be bent to protect the end, or a light **cast** applied. Above the knee, the patient should be placed on his back in bed, a towel thrown over the stump, and **sandbags** so applied as to weigh down the towel on either side of the stump. As a rule no fixation is necessary in the arm. The stump should be kept tightly bandaged. About a week after operation, light **massage** should be carried out and, as quickly as the incision is healed, massage and **active exercise** may be undertaken. At this stage, in amputations of the lower extremity, a leather "**reducing corset**" may be worn, laced up tightly and held onto the stump by a suspender arrangement. Shrinkage of some stumps can often be increased materially by the wearing of a temporary **peg-leg**. This should not be applied earlier than a month after operation, whereas the simple reducing



corset may be applied as soon as the patient is allowed out of bed.

Only 2 types of amputation tolerate "end-bearing": Syme's, if performed under ideal conditions, and the Stokes-Gritti. In most other cases the greater part of the weight is borne on the bony prominences of the joint next above the stump. The shaping of a thigh socket requires the highest type of skilled workmanship. For the stump below the knee, the so-called **double-socket leg**, in which the friction comes between an inner and an outer socket instead of between the stump and the socket (accomplished by suspending the inner bucket or socket from the thigh of the artificial leg by strips of elastic), gives a springy, natural gait and is, as a rule, far more comfortable than the single-socket type. Amputation of the *toe* or toes calls for a special apparatus; the artificial toe is fastened to a plate and the apparatus worn inside the shoe. After amputation below the *elbow* leaving a stump more than 5 cm. (2 in.) long, a very serviceable artificial arm can be constructed. The artificial hand, as a rule, is for cosmetic purposes.

Following *mid-thigh* amputations the femur, according to H. R. Conn (Surg., Gyn. and Obst., Oct., 1926), not infrequently is found to have assumed a flexed and abducted position, with the terminal and external bone edge just below the skin. A painful bursa may be present. On palpation the adductor muscles seem to have fallen away from the bone. Such a stump is not improved by a simple resection. The writer corrects the condition by an external longitudinal excision exposing the femoral shaft. The bursa and scar tissue are freely

excised, and by blunt dissection a bed for the femur formed in the center of the muscle mass. The rectus femoris in front and the vastus lateralis behind are freed and sutured over the bone so as to assure retention. Further, the freed and identified margins of the fascia lata are imbricated with chromic gut. The skin wound is closed in the usual manner. These stumps, thus dealt with, promptly assume a firmer and more conical aspect, with re-establishment of functional activity.

Where, along with terminal sinuses or ulceration, a persistent, infectious marginal *eczema* exists, **mercurochrome** and **gentian violet** give the best results. The skin should be stained by a daily application and protected by frequent changes of dressings. The 2 drugs mentioned being incompatible, they should not be used together or on successive days. Chronic cases with thickening and brawniness are best treated with the **X-ray**.

In dull, persistent *pain* due to contraction of fibrous tissue about a nerve stump, recovery is, as a rule, spontaneous. **Resection** of the nerve trunk should not be done until after a lapse of 6 months. **Paraffin baths** and **diathermy** during the convalescent period may give marked relief. In true **neuromas** nothing avails but **excision** followed by intraperineural **injection of absolute alcohol**.

In a case of *causalgia* originating in an amputation stump of the right thigh, L. Bazy and G. Lataix (Bull. Soc. nat. de chir., lli, 152, 1926) performed a **ramisectomy** by the method of Royle and Hunter, cutting the lumbar rami communicantes of the right sympathetic. The patient had been having numerous attacks of stabbing pain, with general depression, formication

of the head, and trembling and cyanosis of the stump. A practically uneventful recovery followed the operation, and up to 5 weeks later there had been no return of the causalgia.

**AMYLOIDOSIS.**—Several studies on the experimental production of amyloid disease have lately been published. R. H. Jaffé (*Arch. of Path. and Lab. Med.*, Jan., 1926) produced amyloid degeneration in mice by repeated intramuscular injections of nutrose or serum. He ascribed it to an acquired hypersensitiveness to the injected substance. The same observer (*ibid.*, Aug., 1926) found that feeding cholesterol and fat, or dried beef heart powder, delayed for a considerable time the formation of amyloid by long-continued injections of foreign proteins. E. Letterer (*Zent. f. inn. Med.*, May 1, 1926) induced amyloidosis in mice not only with casein and other proteins, but also with peptone, colloidal sulphur and selenium. Increased loss of cell globulins is the first condition for amyloidosis, while the second condition may be a fermentative, chemical or biologic precipitation of globulins. Mice with amyloid showed a reduction of globulins in the serum. Murata and Yoshikawa (*Virchows Arch. f. path. Anat. u. Phys.*, May 28, 1927) induced amyloidosis in rabbits by prolonged feeding with rice straw ash, colloidal silicic acid, or sodium silicate.

**DIAGNOSIS.**—Bennhold's method for the clinical diagnosis of amyloid disease by intravenous injection of 10 c.c. (2½ drams) of a 1 per cent. solution of congo red is strongly endorsed by Schönberger and Rosenblatt (*Wien. klin. Woch.*, Oct. 8, 1925). In these cases 40 per cent. of

the dye leaves the blood within an hour, as against 11 to 29 per cent. in normal individuals. In nephrosis there is also a rapid disappearance of the dye from the blood, but it appears in the urine within ½ hour. A. Bookman and J. Rosenthal (*Amer. Jour. Med. Sci.*, Mar., 1927) likewise praise the test, which they applied in 18 cases. They use a 1.2 per cent. solution, of which 10 to 15 c.c. (2½ drams to ½ ounce) are injected into a vein at the elbow. The needle is left in place and after 4 minutes 10 c.c. of blood are withdrawn. After 1 hour a second specimen of 10 c.c. is taken. The blood is withdrawn through a dry needle into a paraffin tube, which is at once packed in ice, taken to the laboratory, and the blood promptly transferred to an unparaffined centrifuge tube and centrifuged at 1500 to 2000 revolutions for at least 15 minutes. The fibrin is next detached with a needle, the clot allowed to retract, and the tube again centrifuged for 5 minutes. The serum is then pipetted off and the color content of the 1-hour specimen determined with any colorimeter, the 4-minute specimen being used as standard. Disappearance of 60 per cent. or more of the dye from the blood in 1 hour occurs only in amyloid disease. A lower rate of disappearance does not, however, preclude amyloidosis. In pulmonary tuberculosis with amyloid disease, the dye disappears rapidly. In a patient with pulmonary abscess, the positive test helped confirm the suspicion of amyloidosis.

In a young girl subjected to amputation of the leg for osteomyelitis of the tibia, Strasser (*Wien. Arch. f. inn. Med.*, Mar. 15, 1927) kept track of the amyloid disease with the congo red

test and observed retrogression of it after the amputation.

### AMYOTONIA CONGENITA.

—The vast majority of cases of this disorder on record have been in children, most of them in infancy, and only one over 13 years of age. E. B. Block (Jour. Med. Assoc. of Ga., Sept., 1926) reports a case in a girl of 18 years, in which, by reason of the patient's age, an unusually thorough neurologic examination could be made, and in which the basal metabolism and blood chemistry were investigated. There had been no similar disorder in any member of the family. The chief complaints were: Bruises easily; abnormally soft flesh; heart fast; poor endurance. At birth all joints were abnormally limber. The abnormal softness of the flesh is worst in the hands, arms and feet. Hands very wrinkled and dry, yet she perspires freely. No tremor; nerves steady. Muscle strength fair. The face has a doll-like expression. Remarkable hyperextension of all the joints. Weight, 178 lbs. Height, 5 ft. 8 in. A slight blow causes hemorrhage under or in the skin, and a large mass may form. Ecchymoses often appear without knowledge of trauma. Coagulation time longer than normal. Her bruises disappeared under **calcium lactate**. Skin remarkably loose, even though she is rather fat. Marked bilateral pes cavus. All bones extraordinarily small. Marked constipation. Basal metabolic rate, —24. Blood sugar, 103.0 mgm.; non-protein nitrogen, 29.1 mgm.; urea, 13.2 mgm.; creatinin, 0.97 mgm.; uric acid, 1.56 mgm. X-ray of heart showed left ventricular hypertrophy and prominence of pulmonary artery.

Electrocardiogram normal. Heart rate, 100. Hypothyroidism was indicated by the low metabolic rate, sensitiveness to cold, and falling out of hair. Curiously, on taking thyroid, her pulse fell as low as 48, rising again when it was left off. One day she lay down for a nap, seemingly well, and died during sleep, probably from heart-failure. Autopsy not permitted.

A case reported by K. A. Stephenson (Med. Jour. of Austral., July 3, 1926) is in most respects typical. There was extreme muscle hypotonicity, absence of deep reflexes in the early stages, and a tendency toward gradual improvement with later appearance of the deep reflexes. Atypical was the mental dulness; at 3 years only 2 or occasionally 3 words could be put together. There were pads of tissue on the heels (probably fatty), causing the latter to project much further backward than usual. When the pad on the heel was pushed to one side, the foot assumed a normal appearance.

An *essential or primary hypotonia* of young children is recognized by J. Sobel (Med. Jour. and Rec., Aug. 18, 1926). Other forms of hypotonia are classified by him under amytonia (myatonia) congenita, rickets, thymic subinvolution, cretinism, mongolism, obesity, neurologic causes, chorea, and nutritional causes. In essential or primary hypotonia of the muscles and joints, several members of a family may be affected, and the condition may exist in parents or relatives. Mild, moderate and severe cases are encountered. Recovery usually takes place in later childhood or adult life. Some improvement occurred in the writer's cases under **massage, exercises, warm baths, fresh air, sunlight, proper hygiene, codliver oil, syrup of iodide of iron**, regulated and balanced diet, and the use of **mechanical appliances**.

**ANAPHYLAXIS AND ALLERGY.**—There has been much confusion in the clinical classification of the various forms of hypersensitiveness. Even the laboratory workers studying these reactions have differed widely in their views concerning them. There is still a widespread tendency, however, to divide the phenomena into (a) true anaphylaxis and (b) the idiosyncrasies, anaphylactoid or allergic phenomena, although some maintain that the gulf between these 2 groups of manifestations is less distinct than has hitherto been thought.

**ANAPHYLAXIS.**—The existing state of our knowledge of anaphylaxis has been discussed comprehensively by H. Zinsser (Boston Med. and Surg. Jour., Mar. 10, 1927). He defines hypersensitiveness as a state in which an individual reacts specifically to contact with a given substance with symptoms that fail to develop upon similar contact in a normal individual of the same species. Many of the observations necessary for an understanding of these conditions cannot be made upon animals, since their responses are widely divergent. In guinea-pigs the emphasis in the response is upon the smooth muscles of the bronchioles; in rabbits, upon the smooth muscles of the pulmonary arterial system, while in dogs, the liver is particularly involved. The symptom-complex elicited through hypersensitiveness depends upon the location of contact with the material responsible, and not upon the chemical or physical nature of this material. Thus, the clinical pictures of horse asthma, hay fever, etc., are alike, in spite of the difference in the substances eliciting them. In man the

manifestations may be divided roughly into: (1) Serum sickness due to foreign proteins; (2) respiratory conditions due to materials entering by inhalations; (3) intestinal idiosyncrasies, usually complicated by skin manifestations and sometimes by respiratory attacks; (4) a group of skin manifestations which may occur either alone or with other symptoms. The bacterial allergies must be treated separately, involving difficult immunologic problems.

In protein anaphylaxis, after injection of a foreign protein, specific antibodies can be demonstrated *in vitro* by mixing the serum with dilutions of the injected material and observing a variety of effects, among which the formation of a specific precipitate is most obvious. The sensitization can be transferred to a normal animal by injection of the blood serum of a sensitive animal at certain stages. The union of antigen and antibody within the blood stream is relatively unimportant, and shock depends, at least largely, upon their union within or upon the surface of tissue cells. Further than this in the analysis of anaphylaxis we cannot go. Whether there is a sudden injury to the cytoplasm of the cells in which the reaction takes place; whether mere cell surface reaction throws them suddenly into a state of altered function, or whether, as Dale and Manwaring suggest, a poison is suddenly liberated, has not been proved. It is likely that, just as in the idiosyncrasies, there is a reaction which to a large extent involves the capillaries, causing permeability, local edema and abnormal activity of some of the cell groups, e.g., contraction of smooth muscles.

A. F. Coca (Jour. of Lab. and Clin.



Med., Sept., 1927) differentiates from anaphylaxis a condition termed *atopy*, which has the special feature of being hereditary. It comprises provisionally bronchial asthma and hay fever. In the blood of atopic individuals exhibiting a specific cutaneous reaction, sensitizing bodies specifically related to the excitant—atopic reagins—are nearly always to be found. A person producing only anaphylactic antibodies to an antigen is not atopically sensitive to that antigen. The atopic reagins are incapable of conferring anaphylactic hypersensitiveness on the guinea-pig. The date at which an atopic individual will begin to experience atopic symptoms is usually predetermined in the inheritance; many atopic persons have been in constant or annual contact with the excitant (pollens, animal danders) for years previous to the onset of symptoms. The “tissue factor” or “shock organ” is important in atopy; with the same reagins present in the blood, one individual may suffer from asthma only, while another has hay fever. The several atopic shock organs are in general and also individually subject to atopic hereditary influence.

It has been generally believed that *eosinophilia* in asthma or hay fever patients is practically diagnostic of protein sensitization. G. T. Brown (*ibid.*) is forced to disagree with this opinion, however, having seen definitely sensitive asthma or hay fever patients who had no eosinophilia, either during or between attacks. Further, some of the highest eosinophile percentages met with were in non-sensitive or bacterial cases. In nearly all instances the stools were carefully examined for parasites or ova, but none found.

Transmission of anaphylaxis by injections of a substance contained in the blood of dogs sensitized to horse serum has been reported by Maignon (C. r. Soc. de biol., Apr. 26, 1927). The blood withdrawn from the sensitized dogs was desiccated and then subjected to a rather lengthy process of treatment with chloroform water, precipitation with alcohol, washing of the precipitate with ether, etc., yielding finally an opalescent fluid, intravenous injection of 10 c.c. of which into other dogs rendered them susceptible to anaphylactic shock from horse serum. The active substance in the liquid was found to be the same as that causing the opalescence.

*Horse dander* can serve as an anaphylactic antigen in guinea-pigs, according to Ratner, H. C. Jackson and Gruehl (Amer. Jour. Dis. of Childr., July, 1927). Guinea-pigs can be sensitized by *inhalation* of the dander (“respiratory anaphylaxis”). Even fatal shock could be induced by inhalation of dander in guinea-pigs previously sensitized by injection of dander extract. Evidently, anaphylaxis in the animal and asthma in the human subject are fundamentally the same.

*Reversed passive anaphylaxis* has been demonstrated by Opie and Furth (Jour. of Exp. Med., Apr., 1926) in rabbits. Anaphylactic shock occurs when the usual procedure for the production of passive anaphylaxis is reversed, *i.e.*, when an animal previously treated with antigen receives the corresponding antiserum by way of the circulating blood.

Bogomolets has expressed the view that anaphylactic shock is induced by irritation, followed by paralysis, of the vegetative nervous system, through inactivation of the complement in the

nerve cells. Sirotinin (Mediko-biol. Jour., Nov.-Dec., 1926) endorses this view on the basis of experiments on organs isolated immediately after anaphylactic shock.

Whether inactivation of the complement is actually concerned or not, the fact remains that the vegetative nervous system is prominently involved in shock and that many observers have found reason to describe relationships of the *endocrins* to the process. Thus, C. Hajós (Endocrinol., Nov.-Dec., 1926), reviewing the various earlier observations along these lines, and describing personal experiments, concludes that sensitiveness in experimental anaphylaxis is increased by thyroid extract and by insulin; is decreased by parathyroid, adrenalin and posterior pituitary, and is uninfluenced by the sex glands, corpus luteum, and anterior pituitary. Clinical anaphylactic sensitiveness and idiosyncratic symptoms are increased in hyperthyroidism and exophthalmic goiter, and under insulin and thymus treatment; decreased by adrenalin, parathyroid and posterior pituitary, and in myxedema, and uninfluenced by anterior pituitary. Altered function of the female sex glands may be attended with either increased or decreased clinical anaphylactic sensitiveness.

Widal, Abrami and De Gennes, in 1922, recording cases of asthma in subjects with thyroid disturbance, emphasized that among the factors capable of predisposing to anaphylaxis and idiosyncratic shocks, disordered endocrin functioning is one of the most obvious. L. Garrelon and D. Santenoise (Presse méd., May 12, 1926) have made an extensive study of the connection of the *vagus nerves*

with peptone shock (lowering of blood-pressure upon injection of peptone in dogs). Section of both vagi low down in the neck does not prevent the shock, which is, however, abolished or attenuated after vagotomy has been carried out high up (section of the plexiform ganglia above the emergence of the anterior pharyngeal and superior laryngeal nerves). Further experimentation indicated that the reason for the above difference is the intervention of the *thyroid gland*, which receives nerve fibers from the uppermost portion of the vagus and the plexiform ganglion. Section of the vagus fibers to the thyroid had the same effect on peptone shock as high vagotomy. Additional experiments led to the conclusion that the thyroid is caused by the vagus to discharge into the blood a product which increases the susceptibility of the organism to peptone shock.

Hypersensitiveness to *food proteins* is most common in early childhood and, according to H. C. Stuart and M. Farnham (Amer. Jour. Dis. of Childr., Sept., 1926), there is a natural loss of sensitivity to these substances during childhood. The age at which such loss will take place is, however, not predictable. Hypersensitivity to food proteins tends to be present at birth, whereas hypersensitivity to inhalant proteins tends to be acquired—especially during the middle and latter part of the first decade—and is more resistant to change. Since a changing state of sensitization is to be expected during childhood, protein tests should be frequently repeated to obtain the best results with treatment. Excessive exposure to inhalant proteins which show negative skin tests

should be avoided in the asthmatic child; for such a child, feather pillows, hair mattresses, horseback riding, fur coats and pets of all kinds should be proscribed.

**DIAGNOSIS.**—There is abundant evidence in the literature, according to L. C. B. Baldwin (Jour. of Lab. and Clin. Med., Oct., 1926), that protein sensitization may exist in spite of repeated negative skin tests. The writer conducted skin tests in 23 cases of *chronic nephritis*, to ascertain whether hypersensitiveness to proteins is a probable etiologic factor in these cases. While no definite conclusions could be reached, only 2 cases giving definitely positive reactions to food proteins, the procedure followed in his investigation is of value for general guidance in such tests, and hence is summarized here.

Only the commoner food proteins were employed for skin tests, since these seemed the most likely to be responsible for renal injury, if any. The Walker technic was used: Small cuts were made in the skin of the forearm, not deep enough to draw blood, and a protein in powdered form placed on each cut except one, and a drop of decinormal NaOH added as solvent. From time to time the sites were moistened with this, and after  $\frac{1}{2}$  hour the proteins were washed off and the readings made. Over the control cut, decinormal NaOH alone was placed. A positive reaction consisted of a wheal at least 0.5 cm. in diameter, with a variable surrounding zone of erythema. With an erythema measuring 15 to 20 mm., but no wheal, the reaction was termed doubtful, and was repeated on a fresh site on the same or a subsequent day. Only if the reaction was repeatedly

obtained was it regarded as of possible significance. The tested sites were inspected again 24 hours later for delayed reactions. The food proteins employed in the tests were: Wheat globulin, wheat glutenin, wheat gliadin, oat, barley, rye, rice, potato, pea, bean, tomato, egg white, lactalbumin, casein, cocoa, beef, lamb, pork, chicken, halibut, codfish and salmon.

A number of patients having had tonsillitis or infected teeth, they were also tested for sensitization to bacterial proteins with vaccines of the commoner mouth organisms. For this purpose the more delicate intracutaneous method was employed. The arm was cleansed with alcohol and about 0.05 c.c. of the vaccine injected intradermally with a very fine needle. The size of the initial wheal was noted, and readings made after  $\frac{1}{2}$  and 24 hours. The vaccines employed for these tests comprised: *Streptococcus pyogenes*, *S. infrequens*, *S. anginosus*, *S. mitis*, *S. salivarius*, *S. fecalis*, and *Staphylococcus aureus*. When an autogenous vaccine had been made from the tonsils or infected tooth socket, a test was also performed with it.

**TREATMENT.**—Knowing that *food sensitizations* may persist throughout childhood, that strict elimination requires a very abnormal type of life, and that the child may have repeated severe reactions if it is not carried out, Stuart and Farnham (*loc. cit.*) advise treatment by the oral method at an early age. This advice can be given with enthusiasm in milk or egg sensitization, treatment being so regularly successful. Egg and milk are the 2 food reactions most quickly lost in childhood and are the 2 eliminated

from the diet with most difficulty. Fish and nut sensitizations tend to persist much later into life, and these substances are easily excluded from the diet. Some pediatricians now go so far as to prohibit egg-white in the infant's diet until the age of 18 months and to omit fish, nuts and fresh fruits until a later date, knowing that symptoms of allergy will thus be less often encountered.

In the case of a woman aged 30, reported by Parisot, Simonin and Verain (Bull. Soc. méd. des hôp. de Paris, Apr. 23, 1926), ingestion of a small amount of either milk, egg or peas brought on urticaria, nausea, headache and fever. Detailed study revealed a low hydrogen ion concentration and lowered alkali reserve. On this basis alkaline treatment was given, consisting of **sodium bicarbonate** and **sodium citrate** in equal parts, administered in a daily dose of 15 to 30 Gm. ( $\frac{1}{2}$  to 1 ounce) in water. In the course of 10 days the alkali reserve rose steadily, and at the end of this time the previously injurious foods could all be taken freely without anaphylactic manifestations.

**Colchicin** was found useful by L. Duvernay (Lyon méd., cxxxvi, 675, 1925) in a case of multiple anaphylaxis featured by attacks of the colloidoclastic type, with vascular dilatation, urticaria, asthma, periods of pulmonary edema, angioneurotic edema and even an acute rheumatic state, the joints becoming swollen and painful within 1 hour, then subsiding in 3 hours. The anaphylaxis had at first been connected only with milk and cows, but subsequently followed any toxic factor, such as sore throat, intestinal upset, strawberries, mosquito bites, or vaccine. Colchicin checked

or attenuated the urticaria. Emotional impressions and pregnancy were also observed to reduce the anaphylactic manifestations.

In an infant observed by Debbas (Paris méd., May 22, 1926), anaphylactic shock and urticaria followed weaning and the substitution of cow's milk at the age of 3 months. Feeding by a wet nurse likewise induced anaphylactic shocks. Treatment by **desensitization** to cow's milk was therefore instituted, beginning with 5 drops of milk in vegetable soup. Every 3 hours the dose was increased by 5 drops, up to 20 drops on the 1st day. On the 2d day the dosage was raised to 30 drops; on the 3d, to 60 drops; on the 4th, to a teaspoonful, and on the 5th, to a cupful, which was maintained for 3 days. No anaphylactic shocks recurred in the succeeding 6 months.

**Intradermal injections of peptone** in concentrated solution are recommended by P. Vallery-Radot and P. Blamoutier (Bull. Soc. méd. des hôp. de Paris, May 5, 1927) in *hay fever* and *asthma*. In hay fever, the injections should be made only when the sneezing and rhinorrhea have set in, as they have no preventive properties. The best results are obtained by beginning on the 2d or 3d day. The injections must be continued daily for 20 days. Sometimes benefit begins only with the later injections. Cases of asthma with frequent attacks but no complicating pulmonary fibrosis, chronic bronchitis or emphysema are amenable to the treatment, which should be begun during the period of attacks and kept up in courses of 20 injections. Many cases thus treated in the last 3 years have been enabled to resume their usual occupations. In



*paroxysmal rhinorrhea* the same treatment gives distinct, but only temporary results.

Fifty grams of Witte's peptone are dissolved in distilled water, to make 100 c.c., forming a dark brown, viscid solution. This is divided into ampoules of neutral glass and sterilized at 110° C. Proper solution of such a large proportion of peptone is obtained only by allowing the mixture to stand, with occasional stirring, for 24 to 48 hours, and then filtering through filter paper. The initial dose is 0.1 c.c.; the 2d, 0.2 c.c., and all subsequent doses, 0.3 c.c. The solution must be injected wholly within the dermis, and not beneath it or beneath the epidermis; otherwise, necrosis and slight scarring may result. After a properly made injection there is seen an irregular wheal surrounded by a zone of erythema, all of which disappears in about a week. Any more marked reactions are soon dispelled with a warm moist compress. Preprandial peptone therapy may be tried in *urticaria* and *digestive anaphylaxis*.

Chiray (*ibid.*) employed intradermal peptone injections by the above method in 3 cases of hay fever and 2 of asthma, with encouraging results. In some instances the 1st series of injections is inadequate, and repeated courses are required. P. Chevallier (*ibid.*) found the method effective in 2 cases of long-standing, intense *urticaria*. One patient, in particular, had gotten to the point of eating only a few boiled vegetables; 2 prolonged courses of injections cured her. Flandin (*ibid.*) states that pain, redness, and a persistent pigmented nodule sometimes constitute a drawback of the treatment in women, and that he has tried instead

intradermal autoserotherapy or heteroserotherapy, with satisfactory results. Lévy-Solal and Cohen-Solal (Thèse de Paris, 1926) have used intradermal peptone therapy with favorable effects in *hyperemesis gravidarum*.

Hajós (*loc. cit.*) suggests, on the basis of his experiments, that posterior pituitary and parathyroid extracts, as well as adrenalin, be tried on occasion and in proper dosage to prevent anaphylactic symptoms after repeated injections of therapeutic serums. On the other hand, since insulin increases sensitiveness to shock, repetition of a serum injection after prolonged insulin treatment calls for caution.

M. Vernet (Presse méd., Nov. 13, 1926) maintains that the anaphylactic state is characterized, on the whole, by a lowered threshold of excitability due to deficient tissue sensitiveness, interrupted by abrupt, steeple-like rises of excitability at the moment of anaphylactic shocks. Treatment calls for a continued, prolonged remedial action, applied in fractional, moderate doses, kept up during the intervals between the paroxysms, and directed toward restoration of the deficient tissue sensitiveness to normal. For this purpose he finds an extract of *pilocarpus* most effective. The anaphylactic paroxysms, upon its continued use, gradually lessen and then disappear. Favorable results are claimed in paroxysmal rhinorrhea, asthma, some eczemas, urticaria and angioneurotic edema.

**ALLERGY.**—A definite distinction between anaphylaxis and allergy has been made by Cooke in the statement that the idiosyncrasies (allergy) express the natural hypersensitiveness of the individual not produced by immunologic processes. Again, the word "allergy" was first used by von Pirquet as applying to all forms of

reaction capacity of cells. Zinsser (Boston Med. and Surg. Jour., Mar. 10, 1927) espouses the view that there is no fundamental difference between anaphylaxis and allergy. After enumerating various features in which anaphylaxis and allergy are well known to be alike, he points out that the clinical conditions incited by non-antigenic materials are in no important essential different from those incited by antigens. Further, recently acquired knowledge indicates that a substance may still react specifically with an antibody without having the capacity to induce antibody formation. Several observers have shown that many pure lipoids can be converted into truly antigenic material by simple contact with protein.

The property of inducing the formation of circulating antibodies is probably a function of both the chemical constitution and the molecular size (diffusibility) of the injected substance. All circulating-antibody-forming materials are non-diffusible, and in the case of the diffusible ones the entire reaction may well be considered as occurring intracellularly, without the necessity of antibody formation. In bacterial hypersensibility, the writer's work has shown that the specific sensitization is independent of the ordinary bacterial antibodies, and must depend upon a specific cellular reaction substance of a different nature. In many forms of idiosyncrasy, moreover, especially those to drugs, no form of circulating reaction body has been demonstrated, but a cellular specific reaction remains. The only difference between the various forms of allergy seems to lie in that with some antigens the specific antibodies become free in the

blood-stream, whereas in the others this cannot be demonstrated. In this light, the formation of free antibodies is incidental, and not a fundamental difference.

The important relation between the *capillary circulation* and allergic conditions is pointed out by E. S. O'Keefe (Jour. of Lab. and Clin. Med., Sept., 1927). Variations in capillary permeability affect the amount and rate of protein absorption from the intestine and later influence the amount of foreign protein coming in contact with the tissues. Factors influencing capillary circulation have long been known to aggravate allergic diseases. Krogh and Lewis agree that capillary permeability is increased by mechanical, thermal, chemical and photogenic stimuli. Krogh maintains that the increased permeability is directly due to dilatation of the capillaries; this is of great importance in allergic conditions. The 4 forms of stimuli above mentioned have long been known to act unfavorably on eczema. The intestinal capillaries also play a part in eczema. Schloss and Anderson, in infants with diarrhea, frequently found evidence that the normal protection of the organism from foreign protein was lacking, and that milk protein could pass intact through the intestinal wall into the blood. Duke groups under "physical allergy" the allergic conditions due to heat, cold, light and mechanical stimulation, and ascribes them to a hypersensitiveness to foreign proteins formed in the body as a result of these stimuli. Krogh has shown that these same stimuli, dilating the capillaries, induce a local exudation of serum. The protein contained in this serum may be conceived to produce an allergic reaction when

released from the capillaries. According to Manwaring's experiments, protein sensitization of itself results in increased capillary permeability. Manwaring maintains that capillary permeability will ultimately be shown to be the dominant fundamental physiologic change in protein sensitization, to which all other anaphylactic reactions are secondary.

The clinical symptoms of sudden attacks, such as *nitritoid crises*, occasionally following intravenous injection of arsphenamin and other drugs and serums, are caused, according to evidence obtained by E. F. Müller, C. N. Myers and W. F. Petersen (Jour. Amer. Med. Assoc., Apr. 9, 1927), by a sudden reaction of the entire vascular system as well as of almost all organs in the body. The reaction is largely the same as that following the injection of living organisms (chill, etc.); in the latter case, however, the reaction is delayed for the period required for dissolution of the germs and distribution of their toxins. Such a general reaction consists of an intense contraction of the peripheral vessels with simultaneously decreased activities of the peripheral organs, skin and muscles. At the same time, an equally intensive vasodilatation takes place in the splanchnic region, with increased functional activities of the splanchnic organs (increased production of lymph, of stomach juice, acid, etc.), frequently associated with nausea and vomiting. During the reaction, definite changes occur in the distribution of the leukocytes. The nitritoid crisis is obviously a reaction of the vegetative nervous system, depending in its intensity merely on an exaggeration of biologic reactions manifested normally after administra-

tion of arsphenamin, vaccines, serums and proteins.

Symptoms of allergic reaction may be very mild, so that there is only slight itching of the eyes, or so severe that death may take place in a few minutes. On the basis of Duke's description, E. M. Robinson (Med. Jour. and Rec., Aug. 4, 1926) states that the most interesting of the *gastrointestinal symptoms* is abdominal pain, which may be local or general. Frequently it appears a few moments after the ingestion of some particular food; such a history always suggests that the reaction is a result of local contact. The pain may be very severe, but milder and more chronic pain is commoner. Other alimentary symptoms are abnormalities in quantity and acidity of the gastric juice, nausea, vomiting, bloating, diarrhea, mucous stools and pruritus ani. Among the *urologic manifestations* are frequent urination and bladder tenesmus, which are rather frequently the result of general allergy, especially in food hypersensitiveness. The writer has observed such difficulty following ingestion of fruits, vegetables, sea food and cereals. Pain and tenesmus may be such as to confine the patient to bed for months. Bladder allergy of long standing may be complicated by infection, symptoms of cystitis then obscuring the diagnosis. Allergy is perhaps the commonest single cause of *hypotension*.

A case of *death from an allergy test* has been reported by Von Starck (Mon. f. Kind., May, 1926), in a child of 1½ years, suffering from eczema seemingly due to hypersensitiveness to peas. The eczema having shown betterment, the writer wished to test the accuracy of the history, and the boy was given a thick soup containing

peas and other vegetables. After taking 3 spoonfuls of it he died.

In a case of *egg allergy* observed by Jadassohn (Schweiz. med. Woch., July 10, 1926), the antigen was found to be dialyzable and insoluble in ether, being therefore probably neither a protein nor a lipid. Intracutaneous injections of the patient's serum proved capable of transmitting local allergy to other individuals (method of Prausnitz and Küster). These individuals developed urticaria when the antigen was injected at the same place 24 hours later. In addition, "provocation at a distance" proved feasible, local urticaria developing when the antigen was injected elsewhere. *Hay fever* allergens were shown by Klewitz and Wigand (Klin. Woch., July 23, 1927) to resist heating, to be dialyzable, to be negative to the biuret test, and in some instances, to contain no nitrogen.

*Streptococcus allergy* is readily produced in guinea-pigs, according to Zinsser and Grinnell (Jour of Immun., July, 1925). The best method consists of injecting intraperitoneally whole living streptococci. The most potent material for the demonstration of such allergy by skin reaction is the broth filtrate of streptococcus cultures.

**DIAGNOSIS.**—The following points are of diagnostic value, according to Robinson (*loc. cit.*): (1) History of allergic manifestations in the father, mother or any other near relative; (2) a typical red line (dermographism) upon the slightest scratch; (3) relief of symptoms by adrenalin; (4) protein tests, upon which main reliance in diagnosis is placed. As a rule, persons with skin reactions to a given protein will show other reactions to it, *viz.*, when they ingest it or inhale it attacks of asthma, hay fever or

other allergic reactions will occur. In a few cases, a person may show strong skin reactions and no other allergic manifestations. Conversely, in some cases certain proteins are known to cause asthma or other allergic symptoms, yet skin reactions are negative.

In a study of 57 *children* with symptoms of sensitization by G. A. Campbell (Can. Med. Assoc. Jour., Sept., 1926), a family history suggestive of allergy was obtained in 42 per cent. Complete skin tests with all proteins that may have any bearing on the case are deemed by him necessary for success, and the following proteins were used in his series of tests: Twelve cereals, 22 fruits, 28 vegetables, 5 meats, 3 fowls, 6 fish, 4 milk, 3 eggs, 5 nuts, 4 furs, 9 bacterial proteins, 12 epidermals, 14 incidentals and 27 pollens. The proteins most frequently giving positive reactions were: Egg white, 25; duck feathers, 20; goose feathers, 19; chicken feathers and silk, 18 each; egg yolk and sheep's wool, 17 each; dog hair, 15; horse dander, cheese and orris root, 14 each; whole wheat and potato, 13 each; corn, 12, and kapok, rabbit hair, lactalbumin, apple, celery, and tomato, 10 each. Fifty-two other items are also listed, with frequencies ranging from orange, 9, down to canteloupe, 2. Silk proved a much more frequent cause of eczema than had been previously noted; more positives were obtained with silk than with any other protein found in clothing.

In allergic children a history of excessive perspiration is frequently obtained. Children often absolutely refuse foods to which they are sensitive. Group sensitization is frequent; the individual seems to pick out all the fruits,



or vegetables, or meats, or cereals. Eczema is often complicated by impetigo and scabies because water seems to aggravate the rash. Eczema due to foodstuffs tends to disappear spontaneously at 2 years. If due to dander, it will remain until the cause is removed. Asthma is a frequent sequel.

Asthma and eczema sometimes coexist. The earliest manifestations may be persistent head colds, croup, recurrent bronchitis, and the first attacks may closely simulate bronchopneumonia, although fever is usually absent.

**TREATMENT.**—In Campbell's cases the results of anti-allergic treatment were as follows: Eczema in 5 breast-fed infants, all successful; eczema in 27 artificially fed children, 21 successes; asthma, 12, 9 relieved; combined eczema and asthma, 3, all successful; chronic upper respiratory tract infection, 16, 11 successes; cyclic vomiting, 3, 1 success; hay fever, 4, all cured; urticaria, 2, 1 success. Five other unsuccessful cases turned out to be non-allergic, suffering from goiter, habit cough, or tonsils and adenoids. In multiple sensitization, which is the rule in children, removal of the chief offender will often improve the condition, but secondary offenders must be removed as well for a complete cure. Following are a few of the writer's most significant cases:

*Case 2.* Facial *eczema* in a breast-fed infant of 6 months. Tests showed: Casein, 6+; lactalbumin, 4+; egg white, 6+; silk, 2+; strawberry, 2+. Cow's milk accidentally dropped on the child's lips produced local urticaria. Removal of offending foodstuffs from mother's diet, and silk from contact with child's skin, was followed by complete cure in 4 days.

*Case 16.* Child of 11 years, with *eczema* of hands and flexures of the elbows and knees for 9 years. Tests showed: Horse dander, 4+; sheep's wool, 3+; cat hair, 2+; dog hair, 2+; grapefruit, 2+; grape, 1+; raspberry, 1+; cocoa, 2+; veal, 1+; salmon, 1+. Horse dander, although giving the strongest reaction, was not a factor in the case, woolen underwear causing the eczema in the flexures. A pet cat had been a constant playmate from the onset of the eczema. Removal of the cat and woolen underwear was followed by complete cure in 1 month.

*Case 17.* Girl of 8½ years, with *eczematous areas* on the hand and arms of 5½ years standing. Tests showed: Human hair, 3+; silk floss, 2+; silk, 2+; celery, 1+; lettuce, 1+. There was a shocking amount of dandruff in the mother's scalp. The child had moderate dandruff. Mother and child slept together every other week during father's absence. Child used mother's brushes. Treatment of the scalp, plus the measures suggested by the skin tests, were followed by rapid and complete cure.

*Case 21.* Infant of 11 months, with generalized *eczema* for 3 months, following the return of a borrowed baby carriage, which had to be treated with insect powder. The positive tests included pyrethrum 3+. The cause was apparently pyrethrum, which is the basis of insect powder. Upon discarding the baby carriage the eczema disappeared in 5 days, without other treatment.

*Case 27.* Girl of 5 years, with *asthma*. Twenty-eight horses stabled in the back yard. Test results included: Horse dander, 5+; dog hair, 3+; duck feathers, 1+; orris root, 3+. Removal of the dog and desensitization with horse dander, beginning with 1 minim of 1:10,000 solution, gave complete relief. The final desensitizing dose was 12 minims of 1:500 solution.

*Case 31.* Girl of 6 years, with *asthma* for 4 years, interspersed with many attacks of bronchitis. Tests showed: Potato, 6+; sweet potato, 4+; radish, 3+; cauliflower, 2+; parsnip, 2+; string bean, 2+; buckwheat, 3+; corn, 3+; orange, 3+, etc. The attacks were always promptly relieved by vomiting. Vegetables were the chief offenders, and correction of diet was followed by complete relief.

*Case 44.* Boy of 4 years, with continuous head colds for 2½ years, complicated by otitis media and not relieved by adenoidec-tomy. Tests showed: Cat hair, 6+; chicken feathers, 2+. Removal of the family cat and chicken feathers, and a thorough house cleaning, gave complete relief.

*Case 45.* Girl aged 2 years. First attack of asthma when the mother prepared a mustard paste beside her bed to relieve an attacks of bronchitis. Tests showed: Mustard, 3+; celery, 1+; spinach, 1+; apple, 2+; orris root, 2+, etc. With the mother keeping the air breathed by the child free of powdered mustard and orris root, the child went through 2 winters without any colds.

*Eczema* in breast-fed infants responded to treatment particularly well. Offending proteins both in the mother's diet and in the child's clothing must be removed. When attacks of asthma persist owing to impossibility of removing offending proteins, **de-sensitization** must be carried out. This procedure may be very dangerous. When tests are made to determine the weakest solution giving a positive skin reaction, this test should be considered the first dose. The initial dose should be so small that it has never been known to cause a reaction in anyone. The first dilution will usually be 1:1,000,000. *Hay fever* in children responds well to treatment if all sensitizing pollens are used. Retests should be made annually to determine the need of further treatment.

**ANEMIA.—SYMPTOMS.**—According to the observations of B. Goldstein and E. P. Boas (Arch. of Int. Med., Feb., 1927), cardiac dilatation, often accompanied by cardiac hypertrophy, is a common observation in patients with severe anemias. Diastolic murmurs resembling those

of aortic insufficiency are heard in about 10 per cent. of patients with pernicious anemia. These are caused not by organic valvular disease but by a relative insufficiency of the aortic valve. In a smaller number of anemic patients, presystolic murmurs may be present in the absence of mitral stenosis. In patients with severe anemia, the presence of cardiac enlargement, a mitral configuration of the heart, and a diastolic or pre-systolic murmur does not warrant the diagnosis of organic valvular disease. The dilatation of the heart in severe anemia is due most probably to the deficient oxygen supply to the cardiac muscle.

An intermittent vascular murmur of the eye was noticed by Gershenovich (Russk. Klin., June, 1926) in 8 cases of anemia of intermediate or great severity in children. The murmur is systolic, synchronous with the pulse, and disappears upon pressure over the carotid artery. Study of an anesthetized eye showed the murmur takes place in the orbital vessels, not in the eyeball. It is a blowing murmur, and is readily audible upon applying a phonendoscope gently to the eye while the other eye is kept open and the breath held for a few moments. At times it can be heard on simply applying the ear to the patient's eye. Its intensity corresponds to that of the anemia.

**ETIOLOGY.**—The anemias of childhood are classified, according to the order of frequency, by J. C. Gittings and W. B. Stewart (Atlantic Med. Jour., Aug., 1927) into: (1) Nutritional, (2) infectious, (3) toxic, and (4) primary. Food anemia rarely develops during the first 6 months of life, but when milk alone is continued

in the second year and no ferruginous foods are added, a secondary anemia develops with great regularity. It may become extreme, 1 case observed showing only 15 per cent. of hemoglobin. Among premature infants or twins, food anemia is more apt to appear during the 1st year. Rickets, a nutritional disorder, is almost always attended with anemia; an advanced form of this is the von Jaksch anemia, occurring during the 2d half of the 1st year. Of the infectious anemias, the most conspicuous are those due to rheumatic fever and croupous pneumonia, especially with delayed resolution or empyema; next to these come diphtheria, tuberculosis, syphilis, malaria, and intestinal parasitosis; likewise, acute nephritis, because of the close association with acute streptococcic sore throat. The toxic anemias are those due to plumbism or malignancy (especially retroperitoneal sarcoma and tumors of the adrenal and kidney). The primary blood disorders with anemia comprise leukemia, Hodgkin's disease, splenic anemia, hemolytic jaundice, hemophilia, the purpuras, pernicious anemia, aplastic anemia, Gaucher's disease, and sickle-cell anemia.

An increasing incidence of *hunger anemia* among school children in Moscow is noted by V. G. Shtefko (Russk. Klin., June, 1926). Persistent inadequacy of food seems to cause irritation of the bone marrow, which, in fatal cases, showed a predominance of promyelocytes and myeloblasts. Endocrin disturbances may also be partly the cause of the changes in hematopoiesis. The blood shows myelocytes and metamyelocytes, increase of basophiles and mononuclears, a frequency of Türk's cells,

and sometimes plasma cells. According to the investigations of E. B. Hart, Elvehjem, J. Waddell and Herrin (Jour. of Biol. Chem., Mar., 1927), the deficiency in milk leading to nutritional anemia (in children on a whole milk diet) is definitely of inorganic character (lack of iron) rather than of organic nature.

A case of severe anemia due to *intestinal stricture* is recorded by Deutsch (Berl. Med. Klin., July 23, 1926). The patient was a girl of 15 years with post-tuberculous stricture of the intestine. The color index was high. Improvement occurred on a diet mainly of milk and carbohydrates.

That some patients with *cancer* suffer more from the accompanying anemia than from any other symptom is pointed out by D. Eisen (Can. Med. Assoc. Jour., Dec., 1927). In some cases the anemia plays a predominant rôle in the clinical picture. Among the factors entering into its production are chronic, persistent hemorrhage, impaired nutrition, absorption of necrosing tumor tissue and, uncommonly, hemolysis. While coincidence of malignant disease and pernicious anemia is possible, the writer is not inclined to recognize in this an explanation for all cases of malignancy with a pernicious anemia syndrome.

The anemic cancer patients sometimes receive considerable alleviation of their symptoms by treatment for the anemia, particularly **blood transfusion**. In the latter connection the danger of hemolysis of the donor's blood (ascribed by Ewing to a toxic action on the transfused blood by hemolysins arising because of the absorption of necrosing tumor tissue) should be kept in mind. The patient's blood had better be tested for the

presence of hemolysins previous to the transfusion.

*Hemolytic anemia of pregnancy* is discussed by V. C. Rowland (Ann. of Clin. Med., Sept., 1927) as a relatively new subject. The disorder is characterized by an insidious onset of anemia in the latter weeks of pregnancy, often not recognized till the puerperium. Usually, however, there are antepartum symptoms of weakness, breathlessness on exertion, palpitation, headaches, dizziness, edema of the feet, and occasionally an associated toxemia of pregnancy. Labor may come on prematurely and is short and relatively painless. Postpartum bleeding is scant. Stillbirth may occur, but a living child does not share in the anemia and develops normally. Labor aggravates the anemia, and the patient may go into collapse. Typically there is rapid progression of the anemia in the 1st week or 2 after delivery. At times, serious anemia is recognized only after 2 months or more of supposedly simple delay in convalescence.

A definite division of the cases has been made into primary and secondary, hematologically. The secondary types may persist many months or even years, but ordinarily they soon clear up post partum, **blood transfusion** hastening convalescence. The primary types usually show the blood-picture of pernicious anemia, with an occasional aplastic or atypical form. Of 8 cases of the pernicious type, 4 recovered after transfusion, and of 4 not transfused 3 died (Larrabee). Benda, in pregnancy anemias, found a decrease in blood cholesterol and an atrophy of the suprarenals, in contrast to the opposite conditions usual in pregnancy.

The diagnosis of the anemia of pregnancy is to be made mainly from infection, especially postpartum infection and endocarditis, including subacute bacterial endocarditis; in the latter, leukocytosis, embolic phenomena and petechiæ are significant. The bloods of the infant and mother have often been found to be in incompatible groups, suggesting that hemolytic agents from the fetus were responsible for the anemia. This study can be made with very little additional trouble, since the blood of the mother is usually typed in preparation for transfusion.

A case of severe pregnancy anemia of pernicious type is reported by Hoskin and Ceiriog-Cadle (Lancet, Feb. 26, 1927). Predisposing factors in such cases are achlorhydria and general debility prior to the pregnancy. Rapid improvement in this patient occurred following **blood transfusion** and the ingestion of **dilute hydrochloric acid**.

In a study of the blood in cases of *hypertension*, S. F. Adams and G. E. Brown (Ann. of Clin. Med., Dec., 1925) found that in 56 patients with adequate renal function the average red cell count was 4,670,000 and the average hemoglobin 106 per cent., whereas in 20 patients with impaired renal function, as shown by more than 50 mgm. of urea and 2.5 mgm. of creatinin per 100 c.c. of blood, the corresponding averages were 3,870,000 and 81 per cent. There seems to be a close parallelism between erythro-genic and renal function in hypertension, similar to that found in glomerulonephritis, though in the latter the anemia is even more marked. In hypertension with arteriosclerosis, during periods of renal failure the hemoglobin and erythrocytes are



diminished. When there is recovery of renal function, the bone marrow recovers at a slower rate. The presence of anemia in primary hypertension, without complicating disease or gross loss of blood, is good evidence of existing or preëxisting renal insufficiency.

An instance of secondary anemia following *thallium acetate* epilation is recorded by Szentkiralyi (Derm. Woch., July, 1927). A boy of 13, suffering from favus, received 8 mgm. of the drug per kilo. of body weight. After the 1st week he developed severe leg pains, tenderness of the muscles, sleeplessness and loss of weight. There was pronounced reduction of erythrocytes and hemoglobin. The urine was normal. Recovery eventually occurred.

The causes of *secondary aplastic anemia*, which is due to poisons or other agents having a predilection for the bone marrow, are classified by F. D. Murphy and J. M. McEachern (Wis. Med. Jour., Sept., 1926) thus: (1) Measles, scarlet fever, diphtheria, typhoid; (2) severe hemorrhage; (3) chemicals such as benzol, trinitrotoluene, and arsenic; (4) the X-rays. Progressive leukopenia is a valuable prognostic index; when the white cells fall below 2000 the prognosis is grave.

**PATHOLOGY.**—Several further contributions on *sickle-cell anemia* have been published. H. S. Alden (Amer. Jour. Med. Sci., Feb., 1927) states that 105 cases have been recorded. The disorder is a familial and hereditary disease of negroes, characterized by the presence of peculiar sickle-shaped erythrocytes, a moderately severe anemia, a varying degree of jaundice, physical and

sexual underdevelopment, general glandular enlargement and, in most cases, ulcers of the legs. In 1 form of case the sickle-cells are actually in the circulating blood, while in the other form the red cells become sickle-shaped only after standing in a closed chamber for a number of hours. Five necropsies in cases of the former, "active" type showed: (1) A peculiar type of poikilocytosis; (2) profound anemia; (3) a small, contracted, fibrotic spleen with many old and recent hemorrhages and evidences of increased blood destruction in and about the Malpighian corpuscles; (4) a bone marrow showing marked diminution of fat, with numerous sickle- and bizarre-shaped red cells, and a rather marked hyperplasia in some cases. The writer reports the first 2 cases from Ohio, occurring in negro boys 18 and 4 years old. Case I appeared about 12 or 14 years of age, without pubic or axillary hair, with a blood-pressure of  $\frac{98}{50}$ , and a hard, shotty general adenopathy. He showed plainly how sickle-cell anemia may be confused with tertiary syphilis; for 3 months his leg ulcers were regarded as syphilitic. In Case II, abdominal pain and distention coming on suddenly was probably due to a splenic hemorrhage, but was thought due to acute appendicitis at the time.

Experimental studies by E. V. Hahn and E. B. Gillespie (Arch. of Int. Med., Feb., 1927) indicated that the red cells of "latent" sickle-cell cases are transformed into sickle-cells *in vitro* through asphyxia, *viz.*, when the oxygen tension falls below a partial pressure of 45 mm. Hg, provided the pH is within certain limits, probably always on the acid side of 7.4. The sickle distortion is a re-

versible phenomenon; oxygen and CO induce restoration of the discoid form. The sickle form seems to be stable when the hemoglobin is dissociated; the discoid form, when the hemoglobin is combined. Sickle-cell formation *in vivo* is probably induced or increased by anoxemia. Heart and lung disease plays an important rôle in causing excessive hemolysis in persons with the sickle-cell trait. The spleen probably plays a secondary part in the excessive hemolysis of active sickle-cell anemia and is itself damaged in the process, ultimately undergoing atrophy. The writer proposes the terms "depranocytemia" and "depranocyticanemia" for latent and active sickle-cell anemia.

In a case in a colored boy of 18 months, reported by our Associate Editor, A. J. Bell, with R. H. Kotte and A. G. Mitchell (Amer. Jour. Dis. of Childr., Dec., 1927), there were observed: An enormous number of nucleated reds; many reticulated reds; decreased fragility of the erythrocytes; assumption of normal shape by the sickle-cells on standing in moist preparations; the presence of myelocytic cells; an indirect van den Bergh reaction; failure of normal serum to cause sickling of the patient's cells, and failure of his serum to cause sickling of his own repeatedly washed cells.

*Extramedullary hematopoiesis* (blood formation outside the bone marrow) is, according to D. Brannan (Johns Hopk. Hosp. Bull., Aug., 1927), fairly common in certain anemias of infancy and childhood. Large tumor-like growths of hematopoietic tissue may occur, particularly in the hila of the kidneys. The condition occasionally occurs also in the severe anemias of adults,

even in the presence of hyperplastic bone marrow. Hematopoiesis may be observed in the broad ligaments and in organizing thrombi, as well as in the usual sites. Extramedullary blood production is to be regarded as a compensatory reaction. Blood production may be observed in the broad ligaments and breasts of infants under apparently normal conditions.

The 5th case so far reported of severe anemia in a *newborn* infant is recorded by Bonar (Amer. Jour. Dis. of Childr., Feb., 1927). On the 3d day after birth the infant became somewhat pale, and in the 2d week, definitely anemic. The erythrocytes were 1,200,000; hemoglobin, 31 per cent.; leukocytes, 18,000, and color index, 1.3. There were occasional normoblasts, with moderate poikilocytosis and anisocytosis. The mother's blood was but slightly anemic. No cause for the infant's anemia could be found. After 3 or 4 months the pallor gradually passed off, and at 1 year a normal blood-picture was noted.

Discussing physicochemical constants in anemias, Giuffrè (Ped., Mar. 15, 1927) states that he found a *lowered surface tension* of the blood serum in various anemias, including secondary anemias, von Jaksch's anemia, and anemia in myxedema and leishmaniasis.

**DIAGNOSIS.**—J. B. McElroy (South. Med. Jour., May, 1926) gives the following definition of *aplastic anemia*: A severe myelopathy with deficient regeneration of the blood elements, characterized in many cases by extreme pallor of the skin, hemorrhages from the mucous membranes, petechiæ and ecchymoses, absence of splenic enlargement, diminished hemoglobin metabolism, absence of plastic changes in the red blood cells, leuko-

penia and relative lymphocytosis, pronounced thrombocytopenia with lack of reaction from epinephrin and splenectomy, Rumpel-Leede's phenomenon, prolonged bleeding time, non-retractility of the clot, reduced bilirubinemia and aplastic bone marrow, which resists all forms of treatment, and in which splenectomy is positively contraindicated. *Essential thrombocytopenia* is differentiated from aplastic anemia in that there are periodic hemorrhages from mucosæ, frequently enlarged spleen, normal hemoglobin metabolism, presence of plastic changes in the red cells, increase of platelets after epinephrin and splenectomy, and a variegated bone marrow; the disease is often benefited and frequently cured by splenectomy.

The fact is stressed by F. G. Finley (Can. Med. Assoc. Jour., July, 1926) that there is an *axial stream* in the arterioles and in contracted capillaries forcing the red cells into the veins at the expense of the plasma. In making counts it is therefore advisable always to draw the blood from the same source, as that from the veins may be even 10 per cent. higher than that from capillaries. In pernicious anemia, however, the opposite condition prevails, higher counts being found in the capillaries.

*Polychromatophilia* and *basophilic stippling* are best demonstrated, according to Kleeberg and Leitner (Münch. med. Woch., May 13, 1927), by the use of *buffered stains*. The Giemsa or methylene blue solution used should be buffered to maintain the level of pH 6.1.

According to W. W. Duke (Jour. Mo. State Med. Assoc., Oct., 1926), an accurate estimate of the quantity of hemoglobin in circulation can be made by examination of the *palm of*

*the hand*. The physician, having first determined that the color of his palm is normal by comparing it with those of a number of young healthy individuals, compares it with the palm of the patient; very slight differences in color can be noted. The palms of the physician and patient must be at exactly the same distance below the base of the heart when the estimation is made. The hand should be kept semi-flexed for a few moments. Very slight grades of anemia can thus be discovered. The writer has become able to predict accurately how much blood must be given by transfusion to reestablish normal color.

I. C. Brill (Arch. of Int. Med., Feb., 1926) reports a case of what appears to be a new disease—*acute febrile anemia*. The case is similar to 1 lately reported by Moschcowitz (*ibid.*, July, 1925) and another many years ago by Macintosh and Cleland, the 3 cases probably representing the same morbid condition. The essential features are: A more or less acute onset; a rapidly developing anemia resembling the pernicious variety in severity but the secondary variety as to the appearance of the blood corpuscles, and an irregular pyrexia—usually between 100 and 102° F. (37.8 and 38.9° C.). The characteristic pathologic lesion, as described by Moschcowitz, is a plugging of the terminal arterioles or capillaries with hyaline thrombi. In a more advanced stage these hyaline masses are penetrated by fibroblasts and a tubercle-like structure is formed. No light has been shed on the etiology. Blood cultures in 2 instances were sterile. **Blood transfusions** in small amounts and at short intervals proved successful in 1 case (the writer's).

**TREATMENT.**—In secondary anemia, the inquiry into the cause may locate some condition amenable to surgical treatment, which should be carried out if and when the individual can stand it. All the cases, as stated by T. T. Sheppard (Atlantic Med. Jour., Apr., 1926), require **rest**, and where the anemia is severe, preferably **rest in bed**. Some patients have gastric subacidity, and **diluted hydrochloric acid**, 1 or 2 drams (4 to 8 c.c.) well diluted and taken slowly with the meal, will help. **Codliver oil** is another aid. Plenty of **fresh air** and **sunlight** are required, the latter directly on the body, for gradually lengthening periods and with increasing body surface exposed. Lack of sunlight may be partly remedied with one of the **ultra-violet ray** lamps. **Cool** or **cold sponges, baths or packs** are of tonic benefit. Aside from arsenic, mercury and iron, **strychnine** in full doses is of value where general nerve stimulation is needed. **Quinine** is also a good tonic. Small doses of **sodium iodide**, continued for a fairly long period, seem to help. Where there is any question of thyroid deficiency, **thyroid** will usually have a quick, marked effect. **Whole blood**, 5 to 10 c.c. (80 to 160 minims), given intramuscularly daily or on alternate days, seems decidedly beneficial where other methods have failed. According to A. Goodall (Lancet, June 19, 1926), **circulatory stimulants** sometimes appear to start a patient on the path to recovery. **Horse serum** may be given hypodermically, or in 10 c.c. (2½-dram) doses by the mouth; with the latter route the patient should not be informed of the nature of the medicine, lest nausea result.

Practically every case of anemia can be benefited by **blood trans-**

**fusion**, according to Duke (*loc. cit.*). The secondary anemias can be immediately and completely cured if the cause can be removed. **Transfusion** is very useful in anemia due to *chronic ulcer*; when adequate blood volume is restored by it, hemorrhage from the ulcer usually ceases and the ulcer heals. It is also very useful in *chronic sepsis*, including *osteomyelitis* and *septicemia*, when complicated with anemia. *Tuberculosis* with anemia is benefited. It is also valuable in *debilitated individuals* with slight anemia, especially women who lose too much blood by menstruation, and is a specific in *chlorosis*. The indications for transfusion are the same as for iron, to which it is, however, much superior. Small transfusions give imperfect results; large amounts should be given, except in pernicious anemia, where it is best to raise the red cell count only to between 3 and 4 million. The Lindemann syringe-cannula method of transfusion is best; the blood is out of the body only an average of 6 seconds, and reactions are rare. Next to this comes the method of mixing the blood with citrate solution in a glass vessel; reactions are more common.

**Blood transfusion**, as stated by J. C. Gittings and W. B. Stewart (Atlantic Med. Jour., Aug., 1927), not only increases mechanically the amount of hemoglobin in circulation, but also stimulates the bone marrow to new blood formation, as shown by the appearance of normoblasts and other young forms in the blood. In *children*, in addition to intravenous transfusion, there is available the **intra-peritoneal** method, slower but quite efficacious in the end-result. Absorption of the fluid portion of the citrated



blood is rapid, but passage of the cells into the subperitoneal blood-vessels requires a week or more. In a case of food anemia, 6 days after an intraperitoneal transfusion the hemoglobin had risen from 15 to 40 per cent. and the reds from 1,700,000 to 2,900,000. This method is best reserved for children under 2 years in whom suitable veins are not available for the intravenous route and in whom an immediate result is not essential. It avoids the occasional reaction which follows intravenous transfusion.

As for **iron**, combined organic and inorganic iron therapy gives the best results. The leafy green vegetables, eggs and meat are the 3 foods of greatest iron content and hence to be relied on in the prophylaxis and treatment of anemias. Response to dietary iron is slow; addition of inorganic iron, except during an infection, hastens and completes the result. Large doses, such as 30 to 60 grains (2 to 4 Gm.) daily of **saccharated ferrous carbonate**, are best.

In 39 anemic children treated with the customary measures by Rookmaker (Ned. Maand. v. Gen., xiii, 481, 1926), the average hemoglobin percentage of 39 rose to 55 after somewhat over 5 weeks of treatment. In 7 other children, treated similarly but with addition of **subcutaneous injections of blood**, the hemoglobin rose from 27 to 60 per cent. Blood from a member of the family was drawn into a 30 c.c. syringe in which 3 c.c. of 3 per cent. sodium citrate solution had already been introduced. Blood grouping is unnecessary. Weekly injections were given. No ill effects were witnessed except slight fever and in 1 instance, diarrhea.

The **rich liver diet** of Minot and Murphy was administered by T. P. Murdock (Ann. of Int. Med., Sept., 1927) in 4 cases of secondary anemia, 1 of atypical secondary anemia, 1 of Hodgkin's disease, and 6 of pernicious anemia. In the severe secondary cases the diet as outlined by Minot and Murphy was strictly adhered to, while in the moderately severe cases the patient was merely instructed to restrict fats and take generously of liver or kidney, or sweetbreads, lamb, or beef, green vegetables and fruits. The response to the diet was much more rapid in secondary than in pernicious anemia. In the 4 secondary cases, associated, respectively, with recurrent rheumatic fever, bleeding from hemorrhoids, advanced heart failure, and menorrhagia, the red cell count was increased in about 1 to 2 months by from 900,000 to 2,200,000 cells per cu. mm. The hemoglobin percentage also usually showed a marked increase. A like result was obtained in the case of *Hodgkin's disease*, even though the patient's general condition was meanwhile becoming gradually worse. The liver regimen has a definite place in the treatment of both secondary and primary anemias. Improvement in the blood-picture is slow and gradual for the first 3 weeks or so; thereafter, in favorable cases, it progresses rapidly.

A striking parallelism in the incidence of anemias in both adults and children with that of infantile scurvy and other effects of extreme poverty has been noted by H. Aron (Deut. med. Woch., July 1, 1927). To counteract the alimentary factor in anemia, as well as to obviate constipation, which itself acts unfavorably in anemia, he advocates inclusion

in the daily diet of 2 or 3 tomatoes, the juice of 3 oranges, 1 lemon and from  $\frac{1}{2}$  pound of raw meat, as well as 3 or 4 raw carrots or their juice. Large doses of iron may benefit by combining in the bowel with  $H_2S$ , which he regards as an injurious factor. Prolonged use of kefir is also advised.

According to clinical and experimental observations by K. K. Koessler, S. Maurer and R. Loughlin (Jour. Amer. Med. Assoc., Aug. 14, 1926) *vitamin A deficiency* may be a factor of prime importance in severe anemias. The diet should be rich in **vitamins A, B and C**. Blood regeneration cannot take place without vitamin A. Addition of the latter to the diet of animals long depleted of their vitamin A reserve brings about rapid formation of new blood cells. Clinically, the writers advise ingestion of the following vitamin-yielding foods every 24 hours: **Codliver oil**, 5 c.c. (80 minims) 4 times daily; butter, 5 or 6 10-Gm. prints; milk, 6 glasses of 250 c.c. each; cream, 100 c.c. (3 ounces); 2 or 3 egg yolks or whole eggs; also 100 Gm. each of orange (or fresh orange juice), tomatoes (raw or canned), lettuce (or raw cabbage), spinach (or carrots), meat (liver, kidney, sweetbread or brain), and bread (whole wheat made with milk). These foods total 2676 calories. The above diet is a most promising procedure in the treatment of severe anemias, aplastic as well as erythroblastic, including *pernicious anemia*.

In addition to the diet, the patient is to take before each meal 30 drops of **diluted hydrochloric acid** in water, orange juice or lemonade. The same amount is taken during and again just

after the meal. It is taken slowly, through a glass tube. Later, when the patient is accustomed to these quantities, 300 c.c. (10 ounces) of a 0.1 to 0.2 per cent. acid solution is introduced 15 to 30 minutes before meals through a Rehfuß tube, which may be passed into the esophagus by the patient himself. If gastric burning follows, the amount or strength is decreased. Six **yeast tablets** are to be taken daily—2 with each meal.

A case confirming clinically the experimental demonstration of Williamson and Ets (Arch. of Int. Med., Sept., 1925) that iron is ineffective in anemias due to hemorrhage is contributed by A. Goldbloom (Can. Med. Assoc. Jour., Jan., 1927). An infant had a large hemorrhage from the bowel on the 2d day after birth. He nursed for 10 months and received various iron preparations, but at 13 months, though mentally normal, weighed only 9 lbs., 8 oz., and was practically blanched. The hemoglobin was 20 per cent. and the reds 2,350,000. The diet consisted of milk and a little cereal and beef-juice. On admission to the hospital, a **transfusion of 100 c.c. of citrated blood** from the father was given and he was placed on a diet containing liver, beef juice, egg yolk, spinach, cereal, milk, orange juice, and codliver oil, all of which he took well. Three days later he was transfused again, this time intraperitoneally. Next day the hemoglobin was 60 per cent. and the reds 4,000,000. After 5 weeks, the figures were 85 and 5,150,000.

In 8 *premature infants*, Landé (Zeit. f. Kind., Nov. 6, 1926) gave 1 to 2.5 Gm. (15 to 38 grains) of **reduced iron** daily. These large amounts proved to be well borne. The hemoglobin and red cells rose in the 2d and 3d months of life, when ordinarily they decrease. The treatment thus seems advantageous in anemia due to premature birth.

**Splenectomy** was followed by good

results in a case of anemia gradually progressive from the 1st to the 13th year of life, observed by Westrienen (Ned. Maand. v. Gen., xiii, 458, 1926). The spleen was enlarged to a point 4 fingerbreadths below the costal margin. Steady improvement began a few months after the operation, the hemoglobin rose from its original percentage of 20, and the patient was eventually restored to good health. In young infants the writer has had fairly good results from **injections of blood**, 20 to 30 c.c. subcutaneously. In older infants, however, better effects were obtained from **iron** and **interdiction of milk**, even where the cause of the anemia was not alimentary.

The **ultra-violet rays**, according to L. Tixier (Paris méd., Dec. 9, 1925), while ineffectual in pernicious anemia, are decidedly helpful in some other anemias, including most secondary anemias of intermediate severity. They activate blood regeneration and also tend to dispel functional manifestations. Thus, Thédering reported cessation of refractory headache in chloro-anemic young girls. The doses of the rays should be intermediate, with occasional production of a slight erythema. In the *anemias of children* the rays are in some cases rapidly effective. The effect on the eosinophiles seems of interest; of 5 cases treated, 3 developed an eosinophilia of 10 to 15 per cent. during the treatment, and recovered; the 2 which developed no eosinophilia eventually died. The *anemia of rickets* is generally quickly improved or cured, when not too pronounced (below 3,500,000). *Syphilitic anemia* in children usually passes off rapidly when the ultra-violet rays are added to **iron protoxalate** or **sulpharsenol** injections. In

the *anemia of convalescence* from typhoid, pneumonia, or rheumatic fever, the rays act remarkably well, and are especially useful during the winter months. Both the blood and the appetite, nervous system, assimilation and sleep are favorably influenced; 12 or 15 exposures are at least equal in effect to a costly journey to some distant locality. In *cachectic anemias*, e.g., in persistent suppuration, the treatment is also indicated. In a little girl with interminable fistulæ following pleurotomy for streptococic infection complicating tuberculous empyema, recovery began from the time the rays were employed. *Anemias due to hemorrhage*, including traumatic hemorrhage, are recovered from more rapidly with the rays; hemophiliacs, however, are uninfluenced. In the anemias of adults, the effects are the same as in children. In the anemia of *cancer* cases, Saidman has had rather good results by combining general ultra-violet ray exposures (sparing the site of disease) with deep X-ray therapy. The ultra-violet rays (avoiding erythema in these cases) facilitate blood regeneration and improve the strength of the patient.

A. Porcheron and M. Daufresne (Paris méd., Oct. 23, 1926) remind us of the value of a **sea trip** on the basis of a case of refractory anemia in a poorly developed girl of 17 years, in whom menstruation had not yet appeared. Various drugs and a stay in the mountains at a moderate elevation had been employed without effect. A sea trip lasting 6 weeks initiated a "favorable blood crisis" which continued after her return until the blood was nearly normal and general development was resuming its course.

Washed nuclei from the red blood cells of the fowl, injected intravenously

in normal rabbits, were found by O. Larsell, N. W. Jones, H. T. Nokes and B. I. Phillips (Jour. Amer. Med. Assoc., Aug. 27, 1927) to produce marked hematopoietic stimulation. The cytoplasm without the nuclei had no such effect. Clinically, **nucleic acids** obtained by the Kessel-Neumann method were given intravenously in doses of 0.25 to 1 Gm. (4 to 15½ grains), dissolved in saline solution, to 11 patients. In 8 cases there was by the 6th to the 12th day after the injection an increase of 1.8 to 25.9 per cent. in the red cell count. The hemoglobin increased by 2 to 20 per cent. The benefit seemed to cease when treatment was discontinued. Most of the patients complained of chill and other transitory symptoms after the injections.

According to Roelofs (Arch. de méd. des enf., June, 1926), *von Jaksch's* (*pseudoleukemic*) *anemia* is not always fatal in infants. In some of his cases the prolonged use of goat's milk seemed responsible for the disease. Of 17 typical cases, only 2 died. The treatment advised consists of suitable diet, including vegetables and fruits, **codliver oil** with **phosphorus**, **iron** and the **ultra-violet rays**. Often prompt recovery occurred under this treatment. E. A. Beretervide and A. Bianchi (*ibid.*, Jan., 1927), however, maintain that true *von Jaksch* cases never recover. The diagnosis of the disorder is to be based on the presence of megaloblasts in the blood. Supposedly recovered cases are merely instances of secondary anemia, probably of syphilitic causation.

In the *hemolytic anemia of pregnancy*, V. C. Rowland (Ann. of Int. Med., Sept., 1927) endorses **blood transfusion**. Aubertin has resorted to **subcutaneous injection** of 30 to 100 c.c. of **citrated blood**. In puerperal aplastic anemias where transfusion has failed, **arsenic** and **iron** have to be

relied on. Clausser has reported good results from slow intravenous injection of **colloidal antimony trisulphide** in a concentration of 2.53 per cent. It is important to recognize the condition early. In an observed case, rather mild and of secondary type, a 500 c.c. transfusion in the 8th month of pregnancy caused no disturbance. In severe and progressive cases, **termination of pregnancy** should not be deferred too long because of the danger of collapse at parturition. T. P. Murdock (*ibid.*) believes that many cases can be successfully managed with the Minot and Murphy **high nucleoprotein diet**. In a reported case, the patient was placed on this diet after leaving the hospital, and the response was very gratifying.

In *sickle-cell anemia*, **splenectomy** has been tried, with varying results. In the case in a boy of 4 years reported by Hahn and Gillespie (Arch. of Int. Med., Feb., 1927), great improvement resulted, and sickle cells could not be found in the smears for the 1st month after the operation, but they later reappeared. In the case of A. J. Bell *et al.* (*ibid.*, Dec., 1927), in a boy of 18 months, splenectomy caused no change in the sickling of the erythrocytes; there was temporary improvement in the anemia after operation, but 6 months later, marked anemia was present. In the case of T. B. Cooley and P. Lee (*ibid.*), in a girl of 2½ years, there was not so great an immediate improvement in the hemoglobin and red cell count, but 6 months after operation the child felt well and played vigorously, although the hemoglobin and cells remained relatively low; this case presented the picture of a "compensated" hemolytic anemia. As stated by Alden (Amer.



Jour. Med. Sci., Feb., 1927), the treatment of sickle-cell anemia is very unsatisfactory. **Overfeeding, iron and rest in bed** give only temporary relief. Benefit from **transfusion** is short-lived. Because the disease is so similar to hemolytic jaundice, **splenectomy** should be tried. The patients rarely live beyond 30 years.

In *aplastic anemia*, A. G. Gibson (Lancet, Nov. 6, 1926) has had excellent results in 1 case from **adrenalin**. Daily subcutaneous injections of the 1:1000 solution were given, beginning with 2 minims (0.12 c.c.) and increasing gradually to 5 minims (0.3 c.c.). The treatment was suggested by the pigmented skin of the patient, a girl of 11 years with aplastic anemia of unknown etiology. The beginning of recovery coincided with the giving of the injections, which were continued thereafter, with omission of 1 day each week. The recovery was evident within a week after beginning adrenalin, at a time when the condition was extremely critical. The blood count returned to normal. The drug is believed to have acted as a direct stimulant to the bone marrow, of which some still remained to be stimulated. This action had already been used in rickets and osteomalacia. Berchtold found that in large dogs adrenalin causes many more young forms of both red and white cells to be seen in the blood emerging from the nutrient vein of the tibia. There is some evidence also that impairment of adrenal secretion may produce anemia.

Discussing the treatment of *anemias of syphilitic origin*, C. Flandin (Bull. Soc. méd. des hôp. de Paris, June 10, 1926) notes that arsphenamin, and especially neoarsphenamin, possess

an undoubted traumatic effect on the blood. These drugs are therefore contraindicated at the start of treatment for hemolytic icterus of syphilitic origin. In such a case observed in a man of 22 years, the writer used in succession **mercury oxycyanide** intramuscularly, then intravenously, next **quinby**, and finally **treparsol**. All of these were perfectly borne. Aside from a marked improvement in the red cell count, leukocytes, red cell resisting power, and coagulation time, there occurred pronounced diminution of the skin manifestations and splenic dulness, increase of weight, and disappearance of asthenia and of joint and muscle pains. On the whole, in syphilitic blood disturbances, antisyphilitic treatment is indicated, but must be adjusted according to the patient's individual reactions, with special caution at first in long-standing and atypical lesions.

**ANEMIA, PERNICIOUS.**—Attention is called by C. F. Coombs (Brit. Med. Jour., July 31, 1926) to a simulation of cardiac disease by pernicious anemia in its early stages. Cardiac pain has a place among the symptoms of myocardial disease sometimes observed in pernicious anemia. In 10 of 36 cases, the first diagnosis made was that of heart disease. Six of these patients were elderly. Eight had cardiac pain. In 2, attacks of substernal pain during exertion constituted the 1st evidence of ill-health. In altogether 5 instances the pain was brought on by exertion. The *anginal syndrome* occurred in 2.7 per cent. of 1560 cases of pernicious anemia analyzed by Willius and Giffin (Amer. Jour. Med. Sci., July, 1927). It did not differ subjectively

from that of angina pectoris. Radiation of the pain was less frequent and agony was continuous in the severest cases of angina. The syndrome occurred mainly in cases of long duration, but the degree of anemia did not bear any direct relationship. Objective examination of the heart and electrocardiography did not show significant abnormalities. In 1 autopsy only fatty myocardial changes were found. The anginal syndrome in pernicious anemia is due presumably to anoxemia of the myocardium in the absence of coronary or aortic sclerosis.

Rioch and Cameron (Can. Med. Assoc. Jour., Mar., 1926) found that there is in the active stage of pernicious anemia a marked upset in *chloride metabolism*, characterized by lowering of the blood cell chlorides, and in some, if not all, cases, by absence of the chloride ion (as well as HCl) from any gastric secretion that occurs. The former of these abnormalities may disappear in the stages of remission. Cameron and Foster (*ibid.*, June, 1927) add that the lowered cell chloride content is probably due to an osmotic adjustment to an increased cell-hemoglobin content.

The importance of pernicious anemia as a frequent cause of *mental disturbance* is brought out by A. G. Hulett (Med. Jour. and Rec., Jan. 4, 1928). The alienist and lawyer should remember that these patients are presumably of unsound mind, especially in the later months of life. Such a person may well prove not only untrustworthy in a responsible position, but may even suddenly develop into a menace to society by performing irrational acts. The question of mental competence of these cases has a bearing on contractual obligations, deeds and testaments.

**ETIOLOGY.**—Various theories regarding the causation of pernicious anemia are being vouchsafed. The etiologic relationship of *intestinal stasis* is stressed by C. L. G. Chapman and S. E. Duff (Brit. Med. Jour., May 29, 1926), who mention cases apparently showing direct association of stasis with bacterial or chemical toxemia and a later appearance of pernicious anemia. Obstruction resulted from the toxemia and not from any mechanical condition, yet relief of the obstruction by operation did not end the toxemia, which still remained to induce pernicious anemia. K. Faber (Ann. of Clin. Med., Apr., 1926) likewise adduces evidence in favor of the view of intestinal intoxication as an etiologic factor. A. C. Ivy (Northw. Med., Aug., 1926) lays stress on gastrointestinal hemolytic toxins. Hydrochloric acid should be administered with and after meals to patients having a persistent achlorhydria.

Chronic *gall-bladder infection* was demonstrated in all cases of pernicious anemia studied by N. W. Jones and T. M. Joyce (Amer. Jour. Med. Sci., Apr., 1927). The same type of infection was found in a group of cases resembling mild pernicious anemia, in which restoration to fairly normal health followed removal of the infection.

Intravenous injection of *autolysates* of various bacteria brought on pernicious anemia with a blood-picture and histologic lesions the same as those observed in man in 7 out of 16 rabbits experimented upon by Nyfeldt (C. r. Soc. de biol., Mar. 12, 1926).

Some months after the onset of *amebic dysentery*, a case reported by G. Izar (Rif. med., Apr. 25, 1927) de-

veloped all the manifestations of pernicious anemia. Improvement of the dysentery under treatment resulted in a like improvement of the anemia.

The *glossitis* of pernicious anemia is attributed by J. P. Schneider and J. B. Carey (Minn. Med., Apr., 1927) to streptococcus infection. Biopsy in the living patient yielded uniformly in 9 cases a streptococcus of the *viridans* group.

According to Davidson (Lancet, Nov. 5, 1927), bacteriologic examination of the small and large intestine in pernicious anemia demonstrates a non-proteolytic fermentive flora which is typical for this disease. While qualitatively the organisms are similar to those found in health, quantitative study shows an enormous increase of viable germs, and particularly of *B. Welchii*, which the writer regards as the most probable cause of the anemia. Nye (Jour. of Clin. Invest., Apr. 20, 1927) notes a great increase of *B. Welchii* spores in pernicious anemia, but states that the same condition exists in cases of achylia gastrica without pernicious anemia. The increase of these spores in pernicious anemia is probably secondary to the gastric achylia rather than indicative of *B. Welchii* as the primary cause of the anemia.

A disturbance of the *vegetative nervous system* is deemed the foundation of pernicious anemia by Skoog (Mo. State Med. Assoc. Jour., Aug., 1926). This could account for the early defect in alimentary tract secretions, especially the achylia and achlorhydria, and the secondary atrophic states later found in the secreting glands. There would then appear abnormal changes in the intestinal flora and the formation of various toxins, absorbed slowly into

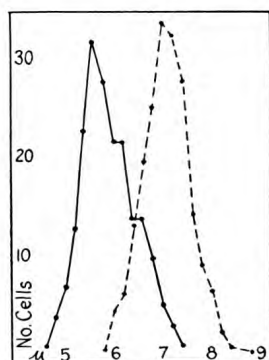
the circulation and insidiously inducing the profound anatomic changes in the spinal cord and brain, peripheral nerves, blood and bone marrow.

Of 90 cases analyzed by J. B. Carey (Minn. Med., July, 1926), 10 gave histories of probable pernicious anemia in the family. There was also a large percentage of tuberculosis and cancer. Among 60 cases with detailed histories, in 7 there was a suggestion of a preëxisting gastric achylia. Four patients with achylia developed pernicious anemia while under observation.

**DIAGNOSIS.**—Neurasthenia, neuritis, chronic rheumatism, pelvic pressure neuritis, food poisoning, colitis and cancer of the liver were the mistaken diagnoses which had been made in some of the cases of pernicious anemia seen by A. T. Todd (Brit. Med. Jour., July 31, 1926). These were tragic mistakes, as the disease appears amenable to treatment only when diagnosed early. Diagnosis is possible in the pre-anemic stage of Addison's anemia. Hereditary transmission of the anemia, and of relative or complete achlorhydria, is so frequent that the relatives of every patient should be examined for these defects. L. F. Barker (Jour. Amer. Med. Assoc., July 10, 1926) notes that early recognition of achylia, paresthesias, glossitis and megalocytosis (before anemia develops) may permit of prompt treatment that will tend to keep the malady latent. Intermariage of members of families in which the disease is known to occur should be discouraged.

Some attention has been paid of late to the *diameter of the erythrocytes* as a diagnostic feature in pernicious and other anemias. The method of cell

diameter determination originally introduced by C. Price-Jones (Jour. of Path. and Bact., Dec., 1920) consists of making a stained blood film, projecting the image on paper, measuring the minimum and maximum diameter, and using the average as the cell diameter; in each film 500 cells are measured. A. R. Mc-

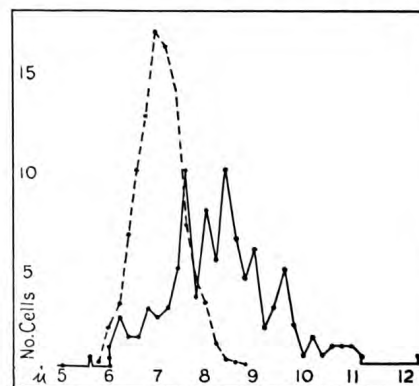


Secondary anemia. Average diameter of 200 cells, 5.90 microns. The broken line represents the author's normal curve. (McCormick, in *Arch. of Int. Med.*)

Cormick (Arch. of Int. Med., June, 1927) dilutes the fresh blood with Hayem's solution and measures the cells in this moist preparation. A Bausch and Lomb Filar ocular micrometer is used. A vertical hair line is seen, consisting of a small wire that moves on a slide by means of a micrometer screw. Attached to the screw is a drumhead on which is a scale divided into 50 parts. The micrometer fits into the draw-tube of the microscope and is secured by a set screw. The apparatus must be accurately calibrated for reliable cell measurement. By means of the micrometer and a mechanical stage each cell can be precisely measured. Only round cells are measured. The normal average diameter in McCormick's series was 7.32 microns (Price-Jones: 7.21). A satisfactory

curve for diagnosis can be obtained by measuring only 100 cells.

The normal curve is symmetrical, with only 1 peak, occurring at about the average diameter. The sides of the curve are almost straight lines. The difference between the smallest and the largest cell was only 3.2 microns, showing the slight normal anisocytosis. In *secondary anemia* the curve is somewhat asymmetrical, but not to a marked degree. It is found to the left of the normal curve. There is usually only 1 peak. In *pernicious anemia* the curve is asymmetrical, and the greater part of it usually lies to the right of the normal curve. The average diameter is greater than normal. The curve is flattened out, with many peaks, there being a marked anisocytosis. In a few cases of pernicious anemia, the curve is different in that it lies to the left of the normal curve,



Pernicious anemia (2,810,000 red blood cells). Average diameter of 100 cells, 8.34 microns. (McCormick, in *Arch. of Int. Med.*)

the average diameter being below normal and all the cells small; these are taken to be cases in which the toxin is so severe as to produce degenerative changes in the bone marrow, so that only cells that are small and poor in hemoglobin are formed.



In patients treated by the liver diet of Minot and Murphy, both types of curves assumed a form resembling that found normally or in secondary anemia. In general, McCormick regards the cell measurements and plotting of the curves as frequently of great diagnostic value.

According to Jorgensen and Warburg (*Acta med scandinav.*, Mar. 22, 1927), a diameter of 8.6 microns or more in over 15 per cent. of the red cells points strongly to pernicious anemia. (This observer gives the normal mean diameter as 7.7). The percentage of macrocytosis is, however, increased not only in pernicious anemia and sprue, but likewise in von Jaksch's anemia, bone marrow tumors, severe malaria, some cases of leukemia, hypothyroidism, in a few cases of gastric cancer, and in poisoning by nitrobenzene, benzene, pyrogallol, lead and radio-active substances. In hyperthyroidism, microcytosis is common.

In regard to the *leukocytes* in pernicious anemia, Arneth (*Zeit. f. klin. Med.*, May 4, 1926) calls attention to the low absolute numbers of both the neutrophils and lymphocytes and to a "shift to the right," the ratio of neutrophils with 2 nuclear fragmentations being reduced from 35 per cent. down to 16 per cent. Most of the lymphocytes are small, and monocytes are almost wanting.

Diagnostic value on the part of the *color of the blood serum* is pointed out by A. M. Fishberg (*Amer. Jour. Med. Sci.*, July, 1926). In pernicious anemia the serum is very constantly golden or golden-brown instead of the normal straw-yellow tint. This is due to an increase in serum bilirubin and to the presence of hematin, the latter apparently being responsible for the brownish

element in the discoloration, when present. Rarely, the serum may even be dark brown. In an anemic patient, pale blood serum speaks definitely against pernicious anemia. The serum color is a valuable bedside aid in the often difficult differentiation of pernicious anemia from *cancer with secondary anemia*. In 2 cases of profound anemia with combined sclerosis and anacidity, both considered at first as pernicious anemia, the serum was almost colorless, and each case ultimately proved to have gastric cancer. The increased serum pigmentation of hepatic metastases may be differentiated from that of pernicious anemia in that in the former the serum always gives a prompt van den Bergh reaction, while in the latter the reaction is delayed. This test will also prevent confusion of pigmentation due to lipochrome with that from bilirubin.

A peculiar toxicity for plant protoplasm on the part of the blood of pernicious anemia cases has been noted by D. J. Macht (*Jour. Amer. Med. Assoc.*, Sept. 3, 1927). Studying the effects of serum solutions on living seedlings of *Lupinus albus*, he found that they inhibited their growth. This phytotoxic property was not shown by blood specimens from various other blood diseases, and by means of the plant test the writer was able to differentiate in doubtful cases between pernicious anemia and other disorders, such as severe secondary anemia, Hodgkin's disease, various leukemias, and carcinoma. Ultra-violet irradiation of pernicious anemia serum rendered it less toxic. Blood transfusion and liver diet in clinical cases had no pronounced effect on the toxicity of the serum, but **ultra-violet ray** therapy, especially with added administration of eosin or tetrabromfluorescein as **sensitizers**, or intravenous **mercurochrome injections** alone, markedly reduced serum toxicity, while causing more or less clinical improvement.

**PROGNOSIS.**—According to W. Dameshek (Boston Med. and Surg. Jour., Apr. 29, 1926), the percentage of *reticulated erythrocytes* is a true index of bone marrow activity and a reliable prognostic factor in pernicious anemia. Before and at the beginning of any remission or permanent rise in the red count, the reticulate count exceeds 6 per cent.; as the culmination of the rise is reached, it gradually falls to normal (0.5 to 1 per cent.). An elevation up to 5 per cent. probably represents regeneration going on in the face of greater destruction; a sudden rise above 6 per cent. presages a coming remission, with overbalancing of the destructive forces. Very grave are continued low counts, which bespeak forthcoming death.

The relapse in pernicious anemia is closely related or, at least, extremely similar to *aplastic anemia*, which, with its evident bone-marrow failure, has an almost absent reticulate count. Platelet regeneration and aplasia are apparently closely related to red cell growth, for in *purpura hemorrhagica* the reticulate count goes up before recovery and remains low with impending death from hemorrhages. In diagnosis, the marked reticulosis in *congenital hemolytic anemia* is a pathognomonic point differentiating that disease from all other other anemias with large spleens.

In demonstrating the reticulated cells in blood smears, Dameshek uses brilliant cresyl blue, 0.3 per cent. in alcoholic solution. Slides having at one end a dried drop of the dye are kept on hand. A drop of blood is placed on a cover-slip, which is inverted on the dye, and the two are allowed to mix for 3 to 4 minutes. One thousand red cells are counted and the

percentage of reticulated cells—cells exhibiting filamentous structures—noted.

**TREATMENT.**—Much attention has been paid of late to the remarkably effective treatment by **liver diet**, introduced by G. R. Minot and W. P. Murphy in 1926. G. H. Whipple and F. S. Robscheit-Robbins (Amer. Jour. of Physiol., May, 1925) had observed experimentally that liver was especially valuable, and beef heart and beef muscle less so, in producing maximal blood regeneration in severe acute anemias due to hemorrhage. Subsequently Minot and Murphy (Jour. Amer. Med. Assoc., Aug. 14, 1926) presented their initial report on the treatment of 45 cases of pernicious anemia with a diet "high in complete proteins and iron—especially liver—and containing an abundance of fruits and vegetables, but low in fat." Their cases had been treated with the special diet for 6 weeks to 2½ years. A prompt remission always followed the use of the diet. While, in 27 cases, the initial red cell count averaged 1,470,000, after 4 to 6 months on the diet, the average was 4,500,000. In 2 cases treated 8 months, a count of 6,000,000 or more was reached. Clinical improvement was rapid in all instances, and was maintained as long as the diet was continued. The rapidity with which the red cells increased was shown in that after but 1 month on the diet the average red count had risen from 1,470,000 to 3,400,000.

The special diet used was made as palatable as possible and for each day was practically as follows:

1. From 120 to 240 Gm., and even sometimes more, of cooked calf's or beef liver. An equal quantity of lamb's kidneys was substituted occasionally.

2. Beef or mutton muscle meat, 120 Gm. or more.

3. Not less than 300 Gm. of vegetables containing 1 to 10 per cent. of carbohydrate, especially lettuce and spinach.

4. From 250 to 500 Gm. of fruit, especially peaches, apricots, strawberries, pineapple, oranges and grapefruit.

5. About 40 Gm. of fat derived from butter and cream, allowed to make the food attractive. Animal fats and oils were excluded so far as possible.

6. If desired, an egg and 240 Gm. of milk.

7. In addition, breads (especially dry and crusty), potato, and cereals, in order to allow a total intake of 2000 to 3000 calories, composed usually of about 340 Gm. of carbohydrate, 135 Gm. of protein, and not more than 70 Gm. of fat. Grossly sweet foods were not given, but sugar was allowed very sparingly.

This diet is rich in iron (about 0.03 Gm.) and in purin derivatives (about 1 Gm.). Patients unable to take much food at first were encouraged to take as much as possible of liver and fruits, and at least some vegetables, while other sorts of food were not forced. After 1 week, the appetite usually improved, and in 2 weeks the complete diet could be taken. Twenty-four of the 45 patients actually weighed the liver and meat taken and estimated the rest of their food for some weeks after the beginning of treatment; the others followed out written directions at home but did not weigh any of their food. The regimen also included **rest**, usually at first in bed for 24 hours a day. All but 3 also took daily 15 c.c. ( $\frac{1}{2}$  ounce) of **diluted hydrochloric acid** (U. S. P.), but the 3 who did not improved like the rest. Among the earliest signs of improvement were more normal regularity and consistence of the bowel movements, increase of reticulocytes, and

decrease of the icterus index of the serum.

Further details as to the dietary requirements laid down by Minot and Murphy are presented by Elgiva A. Nicholls (Boston Med. and Surg. Jour., Feb. 24, 1927) on following page.

The writer also gives a series of 4 daily schedules to meet the needs of patients (1) on liquids; (2) with a weak appetite; (3) with increasing appetite; (4) with established appetite. For these schedules the reader is referred to the original article, on account of space limitations.

The *calves'* or *beef liver pulp* to which some importance has been attached by Minot and Murphy consists of raw liver chopped as finely as possible in a meat grinder and strained through a fine sieve or muslin. It is then diluted with water to suit the given patient, or, if he prefers, diluted with orange or lemon juice and served cold. Some like it mixed with bouillon and served warm. These preparations may be taken as drinks between meals; patients frequently prefer them to the cooked liver dishes.

Since not a few patients find the necessary amount of liver monotonous or otherwise difficult to take continuously, a variety of modes of preparation, with various ways of disguising the liver, is of advantage. The writer gives the following details in this connection:

Two hundred grams (6 ounces) of cooked liver is a day's ration. One calf's liver (uncooked) weighs from 2 to 3 pounds. It will lose about 40 per cent. of its weight in preparation.

- I. Broil slices of calves' liver or beef liver. Do not soak in water first. (Steam chicken livers.)

## FOODS FOR PATIENTS WITH PERNICIOUS ANEMIA (NICHOLLS).

Mammalian Liver Essential: About 200 Grams (Cooked Weight) Daily.

<i>Encourage</i> (in order of importance):	<i>Permit:</i>	<i>Avoid:</i>
1. Mammalian liver Calves', beef, pig, from 90 to 240 Gm. daily	One egg Milk (240 Gm.) Tea <i>ad lib.</i> Coffee <i>ad lib.</i> Cocoa shells <i>ad lib.</i>	Fats not to exceed 70 Gm. per day Butter Cream Cheese
2. Kidneys		
3. Chicken livers	Potatoes	Fat of meats
4. Red muscle meat (trimmed of fat)	Macaroni	Bacon
(a) Beef	Cereals	Pork
(b) Lamb, mutton	Toasted whole wheat bread	Oils
(c) Calves' heart, beef heart	Simple crackers	Cottonseed oil
5. Fruits (fresh, canned or dried)	Sugar not to exceed 20 Gm. per day	Olive in dressings, etc.
(a) Peaches	Pickles	Nuts
(b) Apricots	Relishes	
(c) Oranges	Salt and vinegar	
(d) Strawberries	Poultry	
(e) Grapefruit	Fish	
(f) Pineapple	Shell fish	
(g) Blueberries		
(h) Raisins (steam until soft be- fore serving)		
(i) Prunes		
(j) Other fresh fruit		
About 400 Gm. per day.		
6. Vegetables (cooked or raw)		
(a) Lettuce		
(b) Spinach		
(c) Asparagus		
(d) Cabbage		
(e) Tomatoes		
(f) Other vegetables containing from 1 to 10 per cent. of carbohydrate.		

## II. Remove veins and prepare as one of the following:

- A. Chop in small pieces.  
B. Mince coarsely.  
C. Mince finely and strain.

## III. Season with salt and a pinch of sugar. Moisten with gravy from roast meat, or with broth from boiled meat or fowl.

Additional distinctive seasonings are:  
Curry, chop suey sauce, Worcester sauce, tomato purée with chili sauce, celery salt, onion salt, piccalilli, sherry.

With A, B or C flavored to taste, the following may be prepared:

## HOT DISHES.

- Pie, Cornish pastry or turnover* of A or B plus cooked vegetables, covered with or enclosed in a plain pastry crust.  
*Shepherd's pie* of B or C covered with mashed potato and browned in the oven.  
*Stuffed vegetables.* Tomatoes, green or sweet red peppers, baked potatoes, etc., stuffed with B or C.

*Indian curry* of B or C with raisins and boiled rice.

*Timbale.* A mold lined with boiled rice or macaroni and stuffed with B or C. Steam, invert, and serve with additional gravy.

*Soup.* C with addition of chicken or meat broth or milk. To vary, add strained tomatoes and chili sauce or boiled rice.

*Stew.* A or B plus cooked carrots, onion, potatoes, leeks, served en casserole (improved with sherry).

## COLD DISHES.

*Liver in aspic.* A, B or C set in jellied meat-broth or clear aspic jelly.

*Liver cream.* C set in milk plus gelatin.

*Tomato salad.* Tomatoes stuffed with C and garnished.

*Stuffed egg salad.* Hard-boiled egg-whites stuffed with C.

*Sandwiches.* B or C on toasted white or graham bread, or crackers.

*Club sandwich.* B or C on toast with lettuce, tomato, mineral oil dressing, and thin slice of lean boiled ham.



The following recipes, endorsed by C. R. Jones (Atlantic Med. Jour., Dec., 1927), are credited to the wife of a patient of G. L. Hays:

*Vegetable Soup.*—One quarter pound of liver will make 2 bowls of soup. Grind the vegetables—a heaping tablespoonful each of potato, carrot, celery, cabbage, and turnip, and  $\frac{1}{2}$  tablespoonful of onion. Add one large tomato or almost  $\frac{1}{3}$  can of tomato pressed through a sieve. Cover the liver with at least a pint of cold water and cook almost 10 minutes. Add the vegetables and cook until they are well done.

*Cream-of-Liver Soup.*—Two cups of milk. Flour and butter to make a cream dressing (about one small teaspoonful of butter and a heaping teaspoonful of flour). Add a heaping tablespoonful of minced or ground liver which has been cooked in a small quantity of water. Do not pour off the water; boil it down and add to the cream soup.

*Minced Liver and Rice.*—Brown the liver slightly in a little butter and then cook slowly for a few minutes with the pan covered. Add the liver to the already hot cooked rice—about  $\frac{1}{6}$  pound of liver to  $\frac{2}{3}$  cup of rice.

*Liver Omelet.*—Fry about a heaping tablespoonful or a little more minced liver for a few minutes in butter. Beat 1 or 2 eggs until light, toss them about in hot water, then mix the liver through the eggs.

A French recipe (Jour. Amer. Med. Assoc., Oct. 15, 1927) is as follows:

- 1 pound of calf's liver.
- 3 tablespoonfuls of *grated* bread-crumbs.
- 4 large mushrooms, chopped.
- 1 medium-sized onion finely chopped.
- 2 sprigs of parsley finely chopped.
- $\frac{1}{2}$  teaspoonful of salt and a pinch of pepper.

Cut the liver into slices  $\frac{1}{2}$  inch thick, and sprinkle each slice with the mixture of bread-crumbs, mushrooms and seasonings; put in a casserole, pour over it  $\frac{1}{2}$  pint of cold water or good soup stock, and bake in a slow oven for  $\frac{3}{4}$  hour.

In a case of pernicious anemia in a 16-year old boy, whose strong food antipathies made dietetic treatment difficult, D. O'Hara and J. S. Grewal (Boston Med. and Surg. Jour., July 28, 1927) found a "liver ice-cream" ad-

vantageous. The formula was: Cream, 240 c.c.; sugar and cocoa, of each 15 Gm., and a speck of salt. This is mixed as for ice cream, 45 Gm. of ground liver then added, and the mixture frozen.

Minot and Murphy, in their second report (Jour. Amer. Med. Assoc., Sept. 3, 1927) on the **liver diet**, deal with 105 cases, including the 45 referred to in their original paper. The results previously reported were confirmed. With few exceptions the blood of the cases treated remained in a very satisfactory condition. With the diet taken persistently and satisfactorily, the average red cell count remained above 4,500,000. Twelve patients had taken the diet for about 2 years or longer. Omission of the diet did not *necessarily* result in a fall of the count. Slow improvement, or low counts after high ones established by the diet, were traceable to insufficient liver or to some complication, such as an infection. Previous multiple blood transfusions *sometimes* prevent the usual benefit from liver feeding. Of the patients taking the diet satisfactorily, 44 per cent. had counts of 5,000,000 or more within 4 to 6 months, while about 32 per cent. attained similar levels 1,  $1\frac{1}{2}$  and 2 years after beginning the diet.

Dyspnea, edema, palpitation, weakness, irritability, muscle cramps, etc., decreased rapidly under the treatment. Within 10 days the lemon yellow color often diminished. The tongue symptoms usually vanished very soon. Symptoms referable to the nervous system yielded less completely and readily than others, yet often with gratification to the patient. These symptoms rarely improved until the red cells had in-

creased beyond 4,000,000. In no case was there definite progression in neural lesions while large amounts of liver were being taken. The diet markedly improved some patients with little or no anemia but with dyspeptic or intestinal symptoms and a subnormal sense of well-being. Some such patients have achlorhydria and may be suffering from early pernicious anemia. Persons with premonitory soreness of the tongue, which sometimes recurs intermittently even for years before pernicious anemia is suspected, may be improved by eating liver.

The diet described in the earlier paper was continued unchanged, with some minor variations. Prolonged boiling of the liver is to be avoided. The broth in large amounts is effective. Raw liver is perhaps more efficacious than cooked. The writers have prescribed often about 180 Gm. a day of prepared liver pulp (about equal to a similar amount of cooked liver). The juice pressed from raw liver is efficacious in large amounts. The possibility of infection with parasites seems remote. If necessary, liver may be given by stomach tube; very sick patients thus treated showed remarkable improvement. How much liver must be taken after the red cell count has returned to normal is as yet unknown. Some patients require more than others. Some have taken only 150 Gm. 3 times a week. At least 70 Gm. of red muscle meat a day must be included in the diet. Excess of fat will not inhibit the rapid growth of red cells, but may upset the digestion. Sweet and soggy starch foods often intensify colonic indigestion, and should be curtailed.

The non-protein fraction of liver

which is active in pernicious anemia represents less than 2 per cent. of the organ. Known vitamins are probably not responsible for its beneficial effect. It is soluble in water, is alcohol-precipitable, insoluble in ether, free of lecithin and ordinary lipoids, and contains about 7 per cent. of nitrogen and only a small trace of iron and sulphur.

The non-protein fraction of beef liver prepared by E. J. Cohn, Minot, J. F. Fulton, H. F. Ulrichs, F. C. Sargent, J. H. Weare, and Murphy (Jour. of Biol. Chem., July, 1927) was found capable of benefiting patients with pernicious anemia in the same manner as whole liver. R. West (Proc. Soc. Exp. Biol. and Med., Apr., 1927) has also prepared soluble fractions of beef liver which produced comparable results clinically. Minot and Murphy (*loc. cit.*) state that a few grams of their purest fraction or 15 Gm. of a less pure fraction taken daily by mouth as a powder or in aqueous solution have yielded results analogous to those from ingestion of 200 Gm. or more of whole liver. Thus, in the future one may be able to prescribe a small amount of a powder rather than a large amount of liver. Even so, the patient must take a well-balanced adequate diet, preferably similar to that ordered by the writers with the liver.

In a case in which the liver diet was refused after the red cells had risen from 2 to 4 million, C. R. Jones (Atlantic Med. Jour., Dec., 1927) prescribed **desiccated liver**,  $\frac{1}{2}$  ounce (15 Gm.) daily, with the result that within a month the red cells again numbered over 4 million, which condition was thereafter maintained.

Studying in detail the effects of the liver diet on the blood cells, W. P.

Murphy, R. T. Monroe and R. Fitz (Jour. Amer. Med. Assoc., Apr. 16, 1927) concluded that the diet causes the delivery of new, young red cells from the bone marrow into the general circulation, as evidenced by a prompt increase of the reticulocytes. There occurs also a decrease of bile pigment concentration in the serum, as evidenced by a fall in the icterus index. The increasing red cell count and hemoglobin is accompanied by a progressive growth in the blood tissue as a whole, as estimated by blood volume determinations. The morphologic appearance of the red cells becomes normal, or essentially so; the average cell volume diminishes and approaches normal, and the volume index and stroma index become normal. There are no changes in the non-protein nitrogen of the plasma or in the plasma protein, but the protein of the corpuscles increases notably. According to Minot and Murphy (*ibid.*, Sept. 3, 1927), the rise of corpuscles in amount and rate outstrips the rise in hemoglobin concentration. The initially high color index falls, generally to less than 1 and sometimes below normal. The white cells promptly increase, sometimes to well above normal, with an increased percentage of bone marrow leukocytes. At the same time or slightly later, the blood platelets increase, rapidly approaching, and even exceeding, normal. Within a few weeks the eosinophiles occasionally increase to beyond 20 per cent., this increase persisting for many weeks. L. E. H. Whitby (Lancet, Feb. 11, 1928), in 4 cases, observed an eosinophilia ranging from a few points above the normal maximum of 5 per cent. up to 26 per cent. The eosinophilia ap-

pears after the reticulocytes have gone, and may prove to be another favorable prognostic sign. The release of eosinophiles into the circulation seems to coincide with the subsidence in the stimulation of a highly taxed bone-marrow. Those unaware of the phenomenon are not unlikely to suspect that parasites derived from raw liver ingested have been implanted in the patient.

Observers too numerous to mention, in America as well as abroad, have confirmed the benefits obtained from the liver diet. Among others, W. J. Fetter (Atlantic Med. Jour., Dec., 1927) has reported results analogous to those of Minot and Murphy in 34 cases. The increased number of reticulocytes appeared before any symptomatic improvement, while the latter usually preceded a definite rise in the red-cell count. Cases with marked nervous involvement are exceptions to the general rule of satisfactory clinical improvement. Cases with pictures of tabes and postero-lateral sclerosis were not improved neurally. Numbness and tingling, however, in some instances disappeared, and marked improvement was seen in both the vibratory sense and coördination. Several cases giving the impression of pernicious anemia, yet with some features more characteristic of secondary anemia, failed to respond to the diet, and showed a satisfactory increase of red cells only when iron was added.

Encouraging improvement in the function of the spinal cord under the liver diet is alluded to by J. H. Barach (*ibid.*). A patient whose cord symptoms were so severe as to necessitate the use of crutches was enabled in 8 months to drive an automobile in traffic without difficulty or fatigue.

T. H. Weisenburg (*ibid.*) notes that cord symptoms may precede the blood-picture of pernicious anemia by 2 years or more, usually beginning with a numb or dead feeling in the hands and arms which gradually spreads to all parts of the body, followed by difficulty in walking. He has had good results from the liver treatment. In 1 instance such treatment was instituted on the presence of the cord symptoms alone, with great success.

According to Elders (Ned. Tijd. v. Gen., Nov. 5, 1927), treatment with **beefsteak**, carried out thoroughly, will give results as good as are obtained with 250 Gm. of cooked liver daily. Whipple and Robscheit-Robbins (Amer. Jour. of Physiol., Apr. 1, 1927) find that bone-marrow powder, 30 to 40 Gm. daily, or cooked brains, 200 to 300 Gm. daily, or pancreas, 200 to 300 Gm. daily, definitely assist blood regeneration in severe anemia, but not nearly as much as heavy feeding with liver or kidney.

K. K. Koessler and S. Maurer (Jour. Amer. Med. Assoc., Sept. 3, 1927) urge that the history of patients with pernicious anemia frequently suggests a faulty mode of nourishment deficient in essential foodstuffs, vitamins in particular, over a long period of years. While acknowledging the value of the liver diet of Minot and Murphy, these observers depart from the recommendations of the latter in insisting on a copious supply of **vitamins** in the diet and in declaring that butter, cream, milk and codliver oil, as supreme sources of fat-soluble vitamins, should be ingested in large amounts. The main features of the diet advocated by Koessler and Maurer have already been presented under the preceding caption (see ANEMIA: TREATMENT). This diet in-

cludes liver (or kidney, sweetbreads, calf's brains or calf's lungs). Liver must never be salted while cooking, but only just before serving; otherwise it becomes hard. Liver or kidney should be parboiled for 20 to 30 minutes, then broiled (not fried) on both sides, so that the inside is somewhat rare. Of 42 cases treated with the writers' diet, with initial red cell counts ranging from 550,000 to 3,000,000 or more, all had counts of between 4,000,000 and 5,000,000 in 8 to 14 weeks after the start of treatment. Subjective and objective improvement was striking. The effects on nervous symptoms were "often very remarkable." Some patients unable to walk alone improved so that they could learn to walk again. Emphasis is laid on the possible relation of the subacute combined degeneration of the spinal cord to vitamin B deficiency. All patients are given 3 times daily 1 to 2 teaspoonfuls of powdered brewer's **yeast** (Harris's) or 2 tablets of Harris's yeast tablets (standardized for vitamin B content). Reference is made to the use of a concentrated active liquid **liver extract**, put out for trial use by physicians by Armour and Co., in patients unable to swallow solid food. This "should not replace the feeding of total well-cooked liver, for the latter contains a large amount of vitamins." All patients receive,  $\frac{1}{2}$  hour before meals, 1 tablespoonful of **wheat embryo extract** in orange juice, to supply an ample amount of all known vitamins.

In harmony with the foregoing contribution is the view of Elders (Acta med. scandin., Oct. 8, 1927) that many instances of grave anemia refractory to treatment are in reality



deficiency diseases, susceptible to prevention, improvement, and probably cure by a diet rich in animal proteins and vitamins, including meat, liver, milk, egg yolk, codliver oil and vegetable products such as tomatoes and oranges.

**Hydrochloric acid** has been receiving specific commendation by a number of observers. H. J. Bing (Ugeskr. f. Laeg., May 20, 1926) states that in 4 out of 13 cases given 5 to 8 c.c. (80 to 130 minims) of the diluted acid once or twice daily, remarkable and persistent improvement occurred. Parenteral **milk injections** caused a lesser improvement in 2 other cases. According to M. Pitzman (Mo. State Med. Assoc. Jour., Apr., 1926), the maximum amount of diluted acid taken after meals without discomfort in  $\frac{1}{2}$  glassful of water proved in his 13 cases to be 30 minims (2 c.c.), and the minimum, 15 minims (1 c.c.). These doses can, however, be repeated 3 to 5 times (depending on the size of the meal) at  $\frac{1}{2}$  hour intervals without complaint. Such treatment immediately improved the digestion in all his non-moribund cases, and progressively improved the blood-picture and all the minor signs and symptoms. He regards arsenicals as unnecessary and even, as used in practice, prejudicial. Hurst (Brit. Med. Jour., Oct. 15, 1927) states that the acid should be taken continuously for the rest of the patient's life, however long he may remain free from symptoms—except in the very rare cases in which the achlorhydria is due to gastritis, when suitable treatment results in a return of normal gastric secretion. The mouth and nasopharynx must be kept free from sepsis.

As for **blood transfusion**, A. P. Munsch (Mo. State Med. Assoc. Jour., Sept., 1927) asserts that the necessity for this procedure in pernicious anemia has been reduced more than 90 per cent. by the special diet of Minot and Murphy. Of 30 cases treated by transfusion by H. W. Jones (Jour. Amer. Med. Assoc., May 29, 1926), 20 were living from a few weeks to 7 years after treatment. In 5 cases, the blood was restored to a normal count 3 times. The results to be hoped for from transfusion are: (1) Life in cases with urgent symptoms can be saved; (2) unpleasant symptoms can be alleviated, and added strength and hope given; (3) a remission can be stimulated; (4) the patient can be carried along at a higher nutritional level with the hope that a remission will result; (5) apparent cure in an occasional patient can be brought about. Only 100 c.c. of blood should be given at the first transfusion, to offset the slight possibility of death from the transfusion, unless the patient requires a larger amount to carry him past the danger-point. Whole blood should be used. Moderate amounts—350 to 450 c.c.—should be given, at 4-day intervals. In the hemolytic stage, the amounts should be increased daily, beginning with 50 c.c. In urgent cases, with the patient unconscious or stuporous, the writer gives 450 to 600 c.c. Reactions occur more readily if more than a week elapses between transfusions. The Unger method of transfusion is preferred. It should seldom be necessary to expose the vein. In 3 to 7 days after a transfusion a secondary drop in the red cells and hemoglobin, often bringing the blood count to a

lower level than before, generally occurs; hence the need of not transfusing at intervals longer than 3 to 5 days. For patients belonging to types I or III (Moss) it may be difficult to find sufficient donors. From 5 to 15 transfusions may be required to bring about a normal blood count. Until the hemoglobin is 50 per cent. and the reds 2,500,000, improvement is usually much slower than after this point is reached. According to Nather (*Arch. f. klin. Chir.*, May 6, 1926), the system becomes refractory to this treatment after repeated transfusions have been given.

In patients refractory to arsenic, or almost in a dying condition, Denecke (*Münch. med. Woch.*, June 4, 1926) resorts to **transfusion of defibrinated blood**. The defibrination is effected with slivers of glass. The blood is next filtered through gauze, placed in the ice-box for a few hours to lower the toxicity of the serum, and then injected.

The case of a man aged 65 who received 113 **transfusions**, totalling over 52 liters of unmodified or modified blood, in 3 years from many donors is recorded by J. L. Yates and W. Thalheimer (*Jour. Amer. Med. Assoc.*, Dec. 25, 1926). Even with these transfusions he was able to maintain in circulation only  $\frac{1}{2}$  of the normal number of erythrocytes. Yet he led a fairly active life for 2 years, and could have lived longer had he been willing to follow directions and conserve his energies.

**Insulin** has been reported useful in pernicious anemia by some French observers. The method advocated by Walinski consists in giving blood transfusions in conjunction with 2 injections of insulin daily before meals in ascending doses of 5 to 10 units. He reported 2 cases in which

the combination succeeded where transfusion alone had not sufficed. P. Emile-Weil (*Bull. Soc. méd. des hôp. de Paris*, July 21, 1927) reports 4 cases. In the first, the red cells, which had increased from  $1\frac{1}{2}$  to 2 million after 2 transfusions in 6 weeks, rose in 9 weeks to 4 million upon addition to the transfusions of daily injections of 5 units of insulin. In the second case, insulin and ingestion of liver proved insufficient when used singly, but afforded a rapid cure when combined. In the third, in which transfusions, after some improvement, had lost their effect, insulin alone afforded a slight improvement, while liver alone brought about rapid recovery. In the fourth case, insulin and liver were combined, with prompt good results. On the whole, the results from insulin are less constant than those from liver. It was noted that whereas transfusions were followed next day by a febrile reaction lasting 3 days, with lassitude, later transfusions carried out with the patient under insulin caused no reaction and were much more effective. Lemaire is quoted as having noticed, in a patient whose taste rebelled against liver, that ingestion of **kidney** gave practically the same results as liver. The writer tried insulin or liver in some 10 cases of post-hemorrhagic, hemophilic, or splenomegalic anemias, hemolytic icterus, etc., with results which were distinct, but less striking than those obtained in pernicious anemia.

**Arsphenamin**, 0.075 to 0.15 Gm. intravenously at intervals of 5 or 6 days, is used by E. Hartmann (*Deut. med. Woch.*, June 18, 1926) in pernicious anemia with asserted excellent effects.

H. M. Conner (Med. Jour. and Rec., Jan. 5, 1927), of the Mayo Clinic, regarding pernicious anemia as the result of a gastro-intestinal infection, prescribes **gentian violet** internally as a bacteriostatic against Gram-positive bacteria (in particular *B. Welchii*) and **acriviolet** against Gram-negative organisms. Patients are usually started on 5 to 15 c.c. (80 minims to ½ ounce) of a 1:1000 aqueous solution of gentian violet after each meal, the doses being then increased 1 c.c. (16 minims) or more a day, until 50 c.c. (1½ ounces) or more is being taken 3 times daily. It was also given to some cases in doses of one or two ½-grain (0.03 Gm.) enteric-coated tablets after each meal. In 4 cases, acriviolet (a mixture in equal parts of gentian violet and **acriflavine**) was given instead of the gentian violet alone, or along with it, in doses of 0.1 to 0.4 grain (0.0065 to 0.026 Gm.) in enteric-coated tablets. In most instances in which the dye was used for a sufficient time there was a gratifying increase in the hemoglobin and red cells, and at the last report the hemoglobin and cells were found to have increased to about twice their average values before treatment. The time elapsed ranged from 25 to 46 weeks. In a few cases the treatment had to be stopped because of nausea and vomiting or increase of diarrhea. The patients treated also received dilute **hydrochloric acid**, and in 11 out of the 18, **transfusion** was carried out as well. The best results, however, were obtained in those who had no transfusions.

In all cases **rest in bed** and a **diet** rich in meats, eggs and greens were prescribed.

**ANESTHESIA.**—Chloroform, ether, ethyl chloride, ethylene and nitrous oxide being considered under their respective headings, the present section will deal only with certain general considerations and a few of the special anesthetic methods, *viz.*, the local, spinal, paravertebral and splanchnic procedures.

#### GENERAL CONSIDERATIONS.

—*Preliminary Medication.*—Gwathmey and Hooper (Arch. of Surg., Jan., 1928) recommend, in this connection, an injection of **morphine sulphate**, ⅛ grain (0.008 Gm.), dissolved in 2 c.c. (32 minims) of 50 per cent. **magnesium sulphate** solution. This is repeated once or twice at intervals of 20 to 30 minutes, according to the patient's age, weight and general condition. In women ¼ grain (0.015 Gm.) of morphine usually suffices. Where it is desired to put the patient to sleep entirely, the writers add to the morphine and magnesium sulphate 2½ ounces (75 c.c.) of **ether**, 2 drams (8 c.c.) of **paraldehyde**, and olive oil, enough to make 4 ounces (120 c.c.), by rectum. Where procaine is used for the skin and peritoneum, it should be used in the same percentage as would have been required without the preliminary medication. If **nitrous oxide-oxygen** is used, the oxygen should be increased to 30 or 50 per cent., instead of the usual 9 or 10 per cent.

*Carbon Dioxide.*—The use of carbon dioxide at the Mayo Clinic in 1350 operations as an aid in general anesthesia is reported on by J. S. Lundy (Jour. Amer. Med. Assoc., Dec. 19, 1925). It renders the anesthetic apparently safer and easier to administer. The concentration of carbon dioxide required for optimal results

varies with the individual and the type and stage of operation. Not over 5 per cent. should be administered. The results obtained warrant further investigation of the procedure.

According to B. C. Sword (Anesth. and Analg., Aug., 1927), the administration of carbon dioxide in concentrations up to 10 per cent. gives complete control over the volume of air breathed by the patient. Flexibility of the anesthesia is thus markedly improved and respiratory spasm is avoided. The inhalation, furthermore, counteracts the respiratory depression often encountered in ethylene anesthesia or after the use of morphine. The augmented volume of breathing induced by carbon dioxide at the end of the anesthesia greatly shortens the recovery period. Inhalation of carbon dioxide is followed by a rise of blood-pressure which is particularly marked in cases where the pressure has fallen below normal. Thus, in a case of ethylene-oxygen anesthesia in which the respiration suddenly stopped, the skin became ashy gray, and the pulse was imperceptible, a mixture of 25 per cent. of carbon dioxide and 75 per cent. of oxygen, forced intermittently into the patient's lungs by gentle pressure upon a bag filled with the mixture and attached to a mask over the patient's mouth and nose, caused permanent resumption of spontaneous breathing in 3 minutes. *Resuscitation of the newborn* can be advantageously carried out by gentle inflation in this way with a 1:9 mixture of carbon dioxide and oxygen at 10-second intervals. Giving 10 per cent. of carbon dioxide to excite the intestines in *post-operative distention* and *gas pains* yielded excellent results

within 10 minutes in 10 out of 20 cases, and partial relief in 5 others. In a case of severe *post-operative hiccough*, persisting 84 hours, inhalation of 10 to 25 per cent. carbon dioxide brought relief in 20 minutes, and further brief inhalations were again successful each time the hiccough recurred during the succeeding 12 days.

*The Epiglottis.*—Complete obstruction to respiration under anesthesia may be caused by the epiglottis alone, according to H. M. Wharry (Brit. Med. Jour., May 21, 1927). This occurs oftenest when the patient is in the tonsil position with a sandbag under the shoulders, although it may occur under other circumstances. A long epiglottis is sometimes found tightly impacted over the laryngeal aperture, with its extreme end upcurved and applied to the posterior pharyngeal wall. Even an epiglottis that is not tightly impacted may be lying in contact with this wall. An unnecessary tracheotomy or laryngotomy may be avoided by knowledge of the possibility of these conditions.

*The Oculocardiac Reflex.*—Routine testing of the sympathetic system by means of this reflex previous to general anesthesia is advocated by A. Valerio (Brazil-med., Feb. 13, 1926). Where the reflex is found exaggerated, inhalation anesthesia is inadvisable. Where the reflex is positive, but not exaggerated, the ether should be preceded by atropine. The prognosis is relatively good where the oculocardiac reflex is of the inverted type, but poor where the reflex is abolished.

*Procedure in Certain Complications.*

—E. J. McKesson (Can. Med. Assoc.



Jour., Nov., 1927) recommends administration of gaseous anesthetics under a positive pressure of 5 to 10 mm. Hg under certain conditions. This pressure is secured by tightening the pressure screw on the anesthetizing apparatus as well as the expiratory-valve tension on the face inhaler. When the release of pus by rib resection in empyema is followed by collapse or apnea in a patient *in extremis*, inflation of the lung with oxygen under considerable pressure is sometimes life-saving. Enough pressure of the anesthetic should be continued to fill the lung so as to obliterate the pleural cavity, forcing into the incision any loose masses of exudate, which are withdrawn with forceps, thus shortening convalescence. Some 15 mm. Hg of pressure may be required to open up a lung which has been compressed for some time, but this is well within safe limits, as severe cough produces as much as 40 mm. pressure. In a case of *bronchopleural fistula* with marked dyspnea, subjected to resection of 2 ribs, escaping gas could be heard within the pleural cavity when the pressure was increased to 5 or 6 mm.; the exploring finger stopped the gas escape at the hilus, and a wick of iodoform gauze packed temporarily over the fistula resulted in complete recovery.

Where doubtful of the vitality of the bowel and mesentery after relieving a *strangulation of the bowel*, McKesson administers pure oxygen for 2 or 3 minutes. If the color of the gut changes throughout from black to a lighter red, circulation is still present and recovery of the bowel may be expected. In a man undergoing asphyxiation from froth due to *pulmonary edema* of cardiac origin, he

adopted the emergency procedure of rupturing the bubbles of froth by compressing them under 60 to 80 mm. of pressure with the anesthetic apparatus while the patient was attempting to exhale and then suddenly releasing the pressure by jerking the inhaler from the face. In less than 5 minutes the patient could breathe more efficiently; oxygen without pressure was now inhaled for 5 to 10 minutes more and the circulation was restored, the patient surviving until a similar attack some weeks later in his home, when help could not reach him in time.

The response to brief increase of oxygen is found by McKesson a useful test ("depression test") for the early recognition of depression by anesthetic overdosage before other signs reveal it. When there is a progressive fall in the systolic and, to a less degree, in the diastolic pressure, he inflates the blood-pressure cuff about 10 mm. Hg above the systolic pressure, then, while listening with the stethoscope, he suddenly increases the oxygen percentage in the anesthetic mixture to 50 or even 100 for 1 or 2 breaths, returning to the old mixture immediately after. If the anesthetic has been responsible for the fall of pressures, the systolic pressure will be heard at this higher level and may be rather rapidly run up to normal or higher for a period of a few minutes.

While the pressure rises, the pulse rate usually falls if it has been increased, or it may rise if it has been slower than usual. Failure of the pressure to rise under oxygen points to hemorrhage or shock, rather than excess of the anesthetic, as the cause of the depression.

**LOCAL ANESTHESIA.**—New fields are constantly being developed for local anesthesia, as noted by W. S. Pugh (Northw. Med., Jan., 1927), and patients at times insist upon it. In some European clinics local, including regional, anesthesia has almost supplanted general anesthesia. The writer has used it in over 3000 cases, in practically every part of the body, and is especially struck with its value in urologic surgery. It yields a marked reduction in the operative mortality rate, and the writer has had 100 consecutive bladder operations without a death. He prefers a syringe of 10-c.c. capacity, with Luer-Lok control and a large, comfortable finger grip or thumb rings. A non-corrosive friction ring is important, as it prevents the falling out or slipping forward of the piston. Nickeloid needles will not rust. Steel needles after use should be boiled, then rinsed with alcohol or ether and dried with the Brunet needle-drier. The wire or stylet should be replaced, coated with oil. For raising the wheal the writer uses a needle of 24 gauge and  $\frac{3}{4}$  in. length; for injection of extremities or the scalp,  $22 \times 1\frac{1}{2}$  or 2; for paravertebral anesthesia,  $22 \times 2\frac{1}{2}$ ; for spinal anesthesia or abdominal field-block, 20 or  $22 \times 3$ , and for splanchnic anesthesia,  $19 \times 5$ .

Local anesthesia is particularly commended by A. J. Bryson (Ky. Med. Jour., Apr., 1927) in tuberculous patients, the cardiovascular renal type of case, and highly septic cases with emaciation, depletion of body fluids, etc. Moribund cases of intestinal obstruction or neglected appendicitis also constitute an indication. Accident and industrial surgery is usually satisfactorily managed under

local anesthesia. Caudal block is valuable in conditions of the lower bowel, for cervical cauterization, prostatectomy and perineal lacerations. Satisfactory operations on the head, neck, chest and extremities can be carried out under local. The writer uses local anesthesia in about 60 per cent. of all his cases, with a few under colonic anesthesia (upper abdomen, especially cholecystectomy), and the remainder about equally divided between ethylene and ether.

J. R. Wathen (*ibid.*) strongly favors local anesthesia in *thyroidectomy*. It greatly reduces the risk of injury to the recurrent laryngeals, minimizes bronchitis, pneumonia and vomiting, and spares the toxic goiter heart. Cervical plexus block is first instituted, either by injection of the nerve trunks at the middle of the posterior border of the sternomastoid or by the paravertebral procedure (2d, 3d and 4th cervical roots). Injections are next carried out at the upper poles, along the region of the superior thyroid arteries; and lastly, an injection is made along the line of the collar incision of Kocher. **Novocaine** in  $\frac{3}{4}$  per cent. solution, without adrenalin, is the anesthetic of choice. The dermal wheals are first made with a very fine-pointed needle, and later a large needle is introduced deeply and a few seconds allowed to elapse, to see if any blood issues, before the syringe is adapted. On the evening before the operation 12 to 15 grains (0.8 to 1 Gm.) of **veronal** in the form of the elixir is given, and early next morning,  $\frac{1}{2}$  of this dose. One hour before operation  $\frac{1}{6}$  grain (0.01 Gm.) of **morphine** and  $\frac{1}{200}$  grain (0.0003 Gm.) of **scopolamine** are injected. After the thyroid lobes

have been exposed and the surgeon is ready to elevate and apply forceps to the vessels,  $\frac{1}{4}$  grain (0.016 Gm.) of morphine is injected, which is usually all that is needed for completion of the operation. In operating, too much elevation and traction should be avoided, as they cause pain. This method both increases the operability in damaged heart cases and decreases the mortality.

Elimination of morphine and other accessory drugs in local anesthesia is advocated by J. G. Anderson (*Ann. of Surg.*, May, 1925). The morphine is unnecessary, and the coöperation of the anesthetist and the operating team will diminish mental anxiety. Where 10 minims of 1:1000 adrenalin are combined with every 100 c.c. of procaine solution, the use of 250 to 400 c.c. of the latter means contact with 25 to 40 minims of adrenalin. Such amounts often produce a more or less severe reaction, superficially attributed to idiosyncrasy or injection into the circulation, but really due to an overdose of adrenalin. Riccio and La Rossa (*Arch. ital. di chir.*, Jan., 1926) ascribe to adrenalin various mishaps, especially in thyroidec-tomy and tonsillectomy. Among recorded mishaps are cardiac embarrassment, tachycardia, fever, headache, vomiting, marked restlessness and even death. In cases with high blood-pressure, the additional rise from adrenalin may cause cardiac arrest. A. Weeks and Le R. Brooks (*Anesth. and Analg.*, Oct., 1926) feel strongly that dispensing with adrenalin is an advantage in general surgery. The rise of blood-pressure places an unnecessary burden on the heart and is followed by a secondary depression, while the anxious, fright-

ening feeling induced by adrenalin adds to the mental strain on the patient. The writers can see no difference in the amount or efficacy of the novocaine solution used with or without adrenalin. After operation with adrenalin there is considerable oozing, with resulting hematoma and poor healing. By leaving out adrenalin, more of the local anesthetic can be used, with greater safety. In a large number of minor and major operations done without adrenalin, the writers have not met with the over-anxiety, profuse perspiration, sense of weakness or syncope.

In 52 cases, including tonsillectomies, adenectomies, submucous resections and antrotomies, Williams (*Laryngosc.*, Dec., 1927) substituted **barbital**, 5 grains (0.3 Gm.) 2 hours and again 1 hour before operation, for morphine and atropine. The drug seemed to prevent anesthesia toxicosis, as transient symptoms suggestive of toxicosis occurred in only 2 instances.

According to Urbach (*Med. Klin.*, Jan. 14, 1927), **compression** of a fold of the skin induces, probably by local ischemia, a local anesthesia which is satisfactory for minor procedures such as incision in acne or cauterization of a wart.

**SPINAL ANESTHESIA.**—Having performed 392 operations under this form of anesthesia, J. J. A. McMullin (*Surg., Gyn. and Obst.*, Nov., 1927) concluded that, like all other forms of anesthesia, this method does not fulfill all ideals. **Novocaine** spinal anesthesia is, however, safe provided the injection is made no higher than the 2d lumbar interspace. It produces excellent relaxation. Two grains (0.13 Gm.) of novocaine, dis-

solved in spinal fluid, failed to produce anesthesia in 2.55 per cent. of the cases. There were 2 alarming reactions, but no deaths. The severe reactions both occurred after injections in the 11th thoracic interspace. One patient appeared to be dead, but was revived by prompt intravenous saline infusion with adrenalin. The average drop in blood-pressure for the series was 18 mm. systolic and 15 mm. diastolic. Many patients showed pallor, nausea and vomiting. The mild reactions were treated by placing gauze wrung out of ice water over the forehead and by **ammonia inhalations**. In extensive intestinal resections, resections of the stomach and gall-bladder operations, shock is minimized by spinal anesthesia. The late untoward results of such anesthesia have been greatly exaggerated. For severe headache the writer gives **acetylsalicylic acid**, 10 grains (0.6 Gm.), sometimes with a cupful of **black coffee**, by the mouth. Where the operation is to last more than an hour, one should plan to supplement the spinal by local or general anesthesia. Where the systolic pressure is below 100 mm., some other form of anesthesia should be used. Out of 1428 operations, the writer or his assistants used spinal in 368; spinal, nitrous oxide and ether in 16, and spinal and local in 8.

M. F. Campbell (Ann. of Surg., July, 1926) deems spinal anesthesia, from the standpoint of the surgeon, an ideal method for operations below the diaphragm. His general post-operative mortality was 4 per cent. less in cases given spinal anesthesia, that of general anesthesia being slightly more than 12 per cent. Among 6000 spinal anesthetics, J.

Ducuing (Presse méd., Sept. 24, 1927) met with 3 deaths attributable to the anesthesia. One was in a man of 72 with peritonitis from appendiceal perforation and another in a woman exhausted by hemorrhage. Retention of urine was less common than after ether. In 4 instances there were contractures of the upper extremities, which soon ceased. Among 1146 cases discussed by R. Broglio (Arch. ital. di chir., June, 1926), headache occurred in 12.5 per cent., but was severe only in 12 instances. There was vomiting in 21.8 per cent. and retention of urine in 14.3 per cent. One death could possibly be attributed to the anesthesia.

In gynecologic operations, in which Bello (Semana méd., June 10, 1926) favors spinal anesthesia, he injects 0.08 Gm. of **stovaine** with 0.02 Gm. of **cocaine**, mixed with the spinal fluid. The anesthesia generally lasts 2 hours. According to Leyva Pereira (Rev. méd.-quir. de los hosp., Apr., 1926) **tutocaine** causes less severe headache than does novocaine, and retching is uncommon. The dose used is 0.065 Gm. in adults and from 0.02 Gm. upward in children, in a 5 per cent. solution. The drug is a vasodilator, and the wounds may bleed readily. The writer injects **caffeine** hypodermically after the anesthesia has been induced.

An intravenous injection of  $\frac{1}{260}$  to  $\frac{1}{130}$  grain (0.00025 to 0.0005 Gm.) of **ouabain** proved effective in 2 cases of novocaine-adrenalin spinal anesthesia reported by Doménech Alsina (Rev. méd. de Barcelona, Sept., 1927) in which, although breathing persisted, cardiac arrest seemed to have occurred and unconsciousness had supervened.



The same writer (*ibid.*, Mar., 1927) discusses the therapeutic (peristaltic) effect of spinal anesthesia in *dynamic ileus* and, in particular, in *peritonitis* and *mechanical ileus*. Experimental work in dogs showed the peristaltic action is due to blocking of the pre-ganglionic splanchnic fibers. The peristaltic effect is most prolonged where, as in peritonitis, the intestinal paralysis is the result of increased tone of the sympathetic. Paralysis of the anal sphincter through the anesthesia also contributes to the evacuant effect.

The height of the anesthesia obtained has been found by J. O. Bower, G. Wagoner and J. H. Clark (*Anesth. and Analg.*, Apr., 1926) to vary not only with the dosage but also with the spinal pressure. The lower the pressure, the higher the anesthesia, because of greater diffusion, and *vice versa*. The drop in blood-pressure under spinal anesthesia also varies with the spinal pressure. The drop averaged 26 per cent. with a spinal pressure of 10 mm. Hg and only 12 per cent. with a pressure of 20 mm. Hg. Nausea occurred in 18 per cent. of cases with a spinal pressure of 10 mm. and in only 3 per cent. with a pressure of 20 mm. The simple withdrawal of fluid may induce both nausea and vomiting. Experiments in dogs seemed to suggest that the fall of blood-pressure in spinal anesthesia is preceded by respiratory depression, the vasomotor center becoming depressed only after the respiratory center.

A form of spinal anesthesia confined to the *perineal region*, for use in obstetrical and minor gynecologic operations, is recommended by S. E. Risacher and R. Waitz (*Presse méd.*, Mar. 2, 1927). A solution of 50 Gm. of **novocaine** in 50 c.c. of distilled water is used, put up in  $\frac{1}{2}$  c.c. ampoules and sterilized at 120° C. With the patient in the sitting posture, a small caliber needle is inserted as for lumbar puncture, at the level of the

iliac crests, and as soon as a few cubic centimeters of spinal fluid have run out, the syringe, into which  $1\frac{1}{2}$  drops of the solution have previously been drawn up, is adapted to the needle, a few drops of spinal fluid drawn into it, and the whole injected, without barbotage. The heavy solution at once sinks to the bottom of the dural cul-de-sac, where it anesthetizes only the roots of the cauda equina. Anesthesia of the genito-perineo-anal region is thus obtained within 2 to 5 minutes. The area anesthetized is butterfly-shaped, being bounded anteriorly by the upper portion of the vulva, posteriorly by the sacrum, laterally extending beyond the confines of the perineum, and in depth extending to the cervix. There is complete relaxation of the vagina and perineum. Uterine contractions persist, but the pain of expulsion is abolished, the insensibility of the perineum causing suppression of the tendency to expulsive efforts. The anesthesia lasts from  $1\frac{1}{2}$  to 2 hours. The method is not adapted ordinarily for cases of spontaneous delivery, but was used with gratifying results in 70 cases of *forceps*, *embryotomy*, *breech extraction*, *version* and *perineorrhaphy*. There were no by-effects other than slight headache, which was neither more frequent nor more marked than that following simple lumbar punctures.

**PARAVERTEBRAL ANESTHESIA.**—The mechanism by which blocking of the 12th thoracic and 1st lumbar segments counteracts oliguria or anuria in cases of *prostatectomy* is discussed by Wiedhopf (*Beitr. z. klin. Chir.*, cxli, 171, 1927). In 3 dogs in which the ureters were brought to the exterior, such block-

ing caused within 15 minutes a distinct increase in the urine output with increased total content of sodium chloride. While thus shown experimentally to be effective, the procedure is clinically applicable only where enough functioning renal parenchyma remains to respond, and should not be expected to give results in the uremia of interstitial nephritis.

**SPLANCHNIC ANESTHESIA.**—From a thorough review of the literature of this method, G. de Takats (Surg., Gyn. and Obst., Apr., 1927) concludes that the advantages of splanchnic anesthesia over general anesthesia and paravertebral block in selected cases are proven by ample clinical evidence. In 2335 cases the anesthesia has been induced by the posterior and in 1122 by the anterior route. The latter is the better route as to untoward effects and danger, and is indicated for well-localized upper abdominal lesions. The longer the operation is apt to last, and the more handicapped the patient is by degeneration of parenchymatous organs, the greater its advantages. The aim is to deposit the anesthetic solution in the loose connective tissue in front of the 1st lumbar vertebra, this being an isthmic point where the sensory fibers of the upper abdominal organs unite. The safest dosage of **novocaine** seems to be 70 to 100 c.c. of a  $\frac{1}{2}$  per cent. solution, or, in bad risks,  $\frac{1}{4}$  per cent. **Adrenalin**, 10 drops per 100 c.c., should be added. Instead of novocaine, **tutocaine**,  $\frac{1}{4}$  or  $\frac{1}{8}$  per cent., has proven equally satisfactory. The best premedication is **barbital** by mouth for the night, and a **morphine-atropine** injection  $\frac{1}{2}$  hour before the operation. **Pituitrin** is helpful to maintain the blood-pressure

level during the anesthesia. The lower abdomen can be anesthetized by adding to the splanchnic block anesthesia of the lumbar rami communicantes.

[See also ABDOMEN, SURGERY OF: ANESTHESIA.]

**ANEURISM.—AORTIC.—Diagnosis.**—The diagnostic utility of *Cantani's sign* of aneurism of the descending aorta is confirmed by Adorni (Semana méd., Dec. 24, 1925). This sign may be present relatively early, and consists of the transmission of the heart-sounds to the spinal column. In the writer's case, the heart-sounds were clearly audible on auscultation of the spine from the 2d thoracic to the 1st lumbar vertebræ, and could also be heard, less plainly, along the left paravertebral line from the 3d to the 11th thoracic.

The differentiation of aortic aneurism from *fibroid tuberculosis of the lung* is discussed by J. Génévrier and H. Descomps (Presse méd., Apr. 6, 1927). This topic is not taken up in textbooks, yet sometimes a mistake in this connection may be made, with unpleasant results. A woman of 35 had had influenza with lung congestion in 1918, coughed up a little blood at the time, and had had a cough ever since. In 1925 she coughed up some streaks of blood and complained of dyspnea on exertion. A dispensary diagnosis of tuberculosis was made, although the sputum examination was negative, and the patient sent to a sanatorium for 6 months, at the end of which she considered herself greatly improved. In 1926 she came to a tuberculosis dispensary, where auscultation revealed blowing respiration on the right anteriorly, impaired breath-

sounds posteriorly; on the left, rough breathing anteriorly and pectoriloquy and egophony posteriorly in the interscapular space. Examination of the heart and great vessels showed broadening of the vascular dulness toward the right subclavicular region, a diastolic aortic murmur, pulse slightly stronger on the right side, etc. Fluoroscopy showed the lungs to be quite clear, and the presence of an aneurismal shadow on the right side as broad as the heart shadow itself. The Wassermann proved strongly positive, and the patient had thus, through the error made, been deprived of indicated specific treatment for a long period. In a second case, the man of 47 had been deemed tuberculous ever since the war, and received a pension. Fluoroscopy, when finally resorted to, revealed 2 large aneurismal pockets. **Mercury** and **bismuth** proved indicated and caused some improvement, but the patient soon after died suddenly upon climbing on a chair and raising his arms to wind up a clock. At the autopsy, 2 additional aneurisms on the aorta were found. Conclusion: In the absence of tubercle bacilli in the sputum, the diagnosis of tuberculosis is permissible only upon repeated negative examinations and upon finding unmistakable physical signs.

**Treatment.**—As noted by W. W. Babcock (Ann. of Clin. Med., May, 1926), the prognosis in *thoracic aneurism* is not much better now than 100 years ago. Ligation, acupuncture, wiring, and banding in such cases entail an immediate mortality which is not compensated for by any marked prolongation of life. All operations hitherto suggested have aimed to slow or abolish the current through

the aneurism. In a desperate case, the writer adopted the opposite principle, *viz.*, strove to increase the velocity of blood through the sac by producing in effect a large leak from the aneurism back to the right heart. By virtue of a paradoxical but elemental hydrodynamic law, the walls of an aneurism tend to collapse if the blood can be sufficiently speeded through it, while if the flow of blood is retarded, rupture may occur.

In the case referred to, a **carotid-jugular anastomosis** was established. The distal ends of the internal jugular and common carotid were ligated, and the cardiac ends just above the clavicle anastomosed end to end. The blood from the right common carotid was thus immediately returned to the heart. For 2 or 3 days after, the patient was in a serious condition from the pulmonary congestion; then a marked fall in blood-pressure occurred, with great improvement and relief from pain. Evidence of cerebral degeneration did not develop, and the venous circulation in the right side of the head and neck was much improved. There was no evidence that the blood was driven into the descending vena cava and liver. Myocardial tone improved, and the patient went to work, at which he was still occupied 5 months later.

This new operation is suggested for further trial in advanced, apparently hopeless thoracic aneurisms, and for consideration in certain cases of stenosis or incompetence, in which it is desired to accelerate the circulation through the right heart and lungs. The principle may be carried out by an anastomosis of either the carotid, subclavian or axillary artery with its contiguous vein.

The writer does not favor wiring in thoracic aneurism. The old treatment by **rest, venesection, partial starvation** and **iodides** is preferable. For a peripheral aneurism, **excision** of the sac, with end-to-end suture of the arterial ends, is, when possible, ideal. In peripheral aneurisms difficult of enucleation, the **operation of Antyllus** or **Matas** is valuable.

According to M. R. Reid (Arch. of Surg., Jan., 1926), of 39 cases of aneurism treated by **wiring** at the Johns Hopkins Hospital, 18, or 46 per cent., died in from 1 day to 2 months. No patient was known at the time of writing to have been cured, or to be alive.

Two additional cases of aneurism of the thoracic aorta treated by **wiring and electrolysis** are reported by H. A. Hare (Jour. Amer. Med. Assoc., Jan. 22, 1927). One lived 6 weeks and the other 2 months after the operation. Only sacculated aneurisms are suitable for this method, for blocking of the whole channel in fusiform aneurisms would cause disaster. The more sharply defined the sac, the better the chance of a good result. The procedure is available for "false aneurism," if it is pulsating and growing. It is contraindicated, as a rule, if more than 1 aneurism is shown by the roentgenogram, and if the sac is distal to a large fusiform formation. When there is a syphilitic history, the writer prefers **mercury** to the iodides after operation, since the latter may tend to prevent early organization of the clot. The wire must be wound on a small spool, so that it will coil in the sac in small snarls. It must be only stiff enough to enable the operator to push it through the needle. If too stiff, it will coil

like a clock spring, and offer less surface for clotting. Platinum-gold-silver wire is the only type to use. The best wire is one of 0.014 gauge made of platinum, 10 per cent.; gold, 60 per cent., and silver, 30 per cent. Silver wire will not coil. The needle should be thoroughly insulated. Street current should not be employed. Several dry cells, usually 6 or 8, controlled by a rheostat, are sufficient. The current should never exceed 50 milliamperes, as an excess will practically cook the tissues.

The chief gain by the procedure is an almost complete amelioration of pain. If the wire is fortunately placed, at least a temporary arrest of the growth occurs. In 1 patient, a laborer, life was preserved for 9 years.

One should beware of gumma of the chest wall or thoracic tissues, with a transmitted pulsation and showing in the roentgenogram as a mass forming part of the aorta, when in reality it overlies the vessel.

The best results have been in cases in which the aneurism had already projected through the chest wall, with the skin over it discolored or weeping pink serum.

In a case of **needling** for aortic aneurism reported by J. A. C. Mac-ewen (Ann. of Surg., Sept., 1925), a woman, in spite of prolonged medical treatment, had had such severe symptoms in 1909 as to be considered moribund by her physician. After 3 needlings she was so improved that in 1910 she was able to go to the country, and after further treatment late in the same year, to resume her housework. In 1925 however, the patient strained herself by heavy lifting and there was some recurrence of symptoms, for which she returned to the writer for treatment.



**CARDIAC.**—R. Lutembacher (Bull. méd., Feb. 2, 1927), concerning the X-ray diagnosis of cardiac aneurism, states that direct frontal fluoroscopy fails to reveal such aneurisms unless they involve the middle portion of the heart and are fairly large. Aneurisms of the apex, even when large, are not thus visible; in one such instance the aneurism was as large as the heart itself, was adherent to the diaphragm and was lodged in a large pocket in the liver. Examination at a series of oblique angles is essential if small aneurisms on the surfaces of the ventricles are to be detected. Bordet describes as typical a shadow which lacks homogeneity and is less opaque than that of the heart, especially at the summit of the sac. It is surrounded by a dark zone probably the result of pericardial adhesions in that area. An expansile property of the aneurism is a necessary diagnostic feature. Altered contour of the heart on the left side does not necessarily mean that the aneurism involves the left ventricle; nor does its anterior or posterior situation definitely show its source: The left ventricle, when greatly dilated, overlaps the interventricular septum, so that the anterior aspect of the heart consists partly of the left ventricle. That an aneurism involves the right ventricle is to be concluded only if the left ventricle is not hypertrophied. Fixation of the apex by adhesions is rather common in aneurism in this region, and is clearly revealed only by fluoroscopy. That pain, increased by finger pressure, is located at the site of the adhesions, is suggestive. The adhesion of the apex is unattended with systolic retraction or depression of the ribs.

**CAROTID.**—In 3 cases of aneurism of the common carotid and 1 of popliteal aneurism J. L. Campbell (South. Med. Jour., Nov., 1926) had perfect results from the use of **fascial bands**, which he considers much superior to simple ligation and other procedures. A strip of fascia is passed around the vessel at a point proximal to the aneurism and a mattress suture taken, No. 1 chromic gut being used. In placing the suture a careful estimate is made of the amount of pressure needed to secure a partial occlusion of the artery, obliterating pulsation in the vessel and in the aneurism below. One end of the fascial band being left long, this end is carried over the original suture line and sutured farther around the vessel by lateral stitches. An advantage of this procedure over simple ligation is the lessened danger of secondary hemorrhage.

J. E. Paterson (Glasgow Med. Jour., Oct., 1927) reviews the arguments for embolism and for ischemia as the cause of cerebral symptoms after ligation for carotid aneurism. If the embolic view is correct, treatment by simple ligation, by Perthes's method, should not be followed by cerebral complications. This method aims to avoid rupture of the intima in ligation, thrombosis being much less likely when this coat remains intact. A strip of fascia lata is passed under the artery and tied in a half knot round it. The ends are then gradually tightened till pulsation distal to the band has ceased, when a stitch or 2 of catgut are passed through the fascial loop to fix it in position. In the writer's case, a man of 60 years had developed, following a blow in the neck by a wooden stake,

an aneurism of the size of a tangerine orange at the bifurcation of the left common carotid. Macewen's needling having had no effect, **proximal ligation by Perthes's method** was carried out. There was some mental alteration for about a week. The aneurism continued to pulsate vigorously. Five weeks after operation it was still fully  $\frac{2}{3}$  its previous size, but after 8 months, only a small, firm mass remained, about the size of a cherry. Above it, both external and internal carotids could be felt pulsating, making it probable that a circulation was being carried on between these vessels by way of the shrunken sac. The patient complained of some numbness of his right hand, but nothing in the way of sensory or motor objective symptoms was present.

**CEREBRAL.**—When there are signs of pressure on brain tissue, I. J. Sands (Jour. of Nerv. and Ment. Dis., July, 1926) asserts, intracranial aneurisms should be thought of. The diagnosis is very probable if, with a bloody spinal fluid, there coexist cervical rigidity, a positive Kernig sign, and a cranial nerve lesion. An intermittent character of the symptoms is also of diagnostic value.

**POPLITEAL.**—In a boy of 14 years who had been shot in the knee, G. Streit (Schweiz. med. Woch., May 8, 1926) successfully performed **excision** of a popliteal aneurism which had developed 2 months after the injury. The aneurismal sac was removed together with a segment  $2\frac{1}{2}$  cm. (1 inch) long of the artery, the ends of which were sutured with the knee flexed. Examination 10 years later seemed to show that the vessel was pervious. The suture had held during the boy's subsequent growth.

The vein accompanying the artery had also been resected and ligated at the operation—a procedure which, with many others, the writer deems helpful in reducing the chances of gangrene.

**SPLENIC.**—H. Näher (Deut. Zeit. f. Chir., Aug., 1926) states that among series of 220, 183, 93 and 58 aneurisms observed at necropsies in 4 different institutes of pathology, no less than 4, 9, 7 and 1, respectively, were aneurisms of the splenic artery. His own patient was a woman of 54 who had had a painful swelling in the left hypochondrium for 1 year. In the last 3 months there had been a sensation of fulness there after meals. A rounded mass of the size of an adult head, moving but slightly on respiration, could be felt. There was no fremitus nor pulsation. The urine was normal. At operation the splenic artery was found to be of the size of the carotid, and the aneurism flattened out the splenic tissue. **Splenectomy** was successfully carried out.

**SUBCLAVIAN.**—In a case of subclavian aneurism in a man of 49, reported by W. C. G. Kirchner (Surg., Gyn. and Obst., Dec., 1926), the causative bullet wound had been sustained 10 years before. At operation, a double strand of No. 2 chromic catgut was placed at the 1st portion of the artery and **ligation** performed. Upon opening and clearing out the sac, which was found to have several chambers or pockets, hemorrhage from within was profuse, coming from the internal mammary, the vertebral and the thyroid axis. These vessels were with some difficulty ligated, the last 2 *en masse*, and the globular portion of the sac was obliterated by imbrication of the mar-

gins (Matas), the resulting mass being about 3 cm. (1½ in.) in diameter. The general postoperative course was uneventful. Wrist drop developed, but sensation everywhere was complete. Two years later, the patient was not using the arm much, and there was considerable muscular atrophy; the radial pulse could not be felt. The aneurism remained completely cured.

Most simple ligations of the subclavian artery alone have resulted in recurrences. Gradual obliteration with Halsted's aluminum bands is of service especially if there is any doubt as to the circulation in the extremity. As for the radical procedures, some have obtained good results by complete excision of the aneurism, but the writer prefers **obliterative endoaneurismorrhaphy**. Whether a 1- or 2-stage operation is to be performed depends upon various associated factors.

**ARTERIOVENOUS.**—An enormous arteriovenous aneurism of the abdominal aorta and vena cava developed 3 weeks after a man observed by A. M. Grigorjew (Novyj chir. arch., viii, 283, 1925; Surg., Gyn. and Obst., Dec., 1926) had attempted suicide by shooting himself in the abdomen. Although, on exploration, the condition seemed inoperable, the introduction of a bronze-aluminum wire into the sac was followed by gradual diminution in the size of the aneurism and an improved general condition. Later, the patient was readmitted to the hospital because of loss of strength and a tumor in the epigastrium. At a second laparotomy the sac, which was found collapsed, was split open and the spiral wire, surrounded by soft tissue, with-

drawn. Complete recovery followed, and a year later the patient was still working at his occupation of locksmith.

**MYCOTIC.**—R. D. Leas and H. S. Thatcher (Arch. of Int. Med., Aug., 1926) report 2 cases of aneurism of bacterial causation. The 1st case was one of bacterial endocarditis with hemolytic streptococcus septicemia, with positive blood culture and embolic phenomena. The endocarditis persisted in a chronic form, with exacerbations, for 8 years. The mycotic aneurism, which developed in the superior mesenteric artery, was under close observation for 4 weeks prior to death, during which time it increased in size and caused severe abdominal pain. The 2d case was one of *Streptococcus viridans* septicemia, with evidence of endocarditis, etc. The patient had had a rheumatic attack 5 years before. In this case there were mycotic aneurisms of both the aorta and the superior mesenteric artery.

**ANGINA, AGRANULOCYTIC.**—This is a term recently coined to describe a condition of sore throat with leukopenia due to the disappearance from the circulating blood of all or almost all of the white cells belonging to the granular or myelogenous series, *i.e.*, a neutrophile leukopenia with, of course, a relative lymphocytosis or, as some would say, "mononucleosis." The term *monocytic angina* is also sometimes applied to it. As pointed out by H. P. Schenk and O. H. P. Pepper (Amer. Jour. Med. Sci., Mar., 1926), most of the reported cases have had leukocyte counts below normal, some as low as 900 per cu. mm., with as high as 98 per cent. of lymphocytes; but

in a few cases the total count has been normal or even above normal for at least part of the illness. Thus, one of Zadek's cases had a total count of 17,100, of which 86 per cent. were lymphocytes. This case, perhaps one of infectious mononucleosis, recovered promptly, whereas the cases reported with characteristic leukopenia all die. One case reported by Moore and Wieder recovered from her first attack, in which the count fell to 1200, but succumbed to a second attack 2 years later.

These cases resemble closely the picture presented by any overwhelming infection in which there occurs a neutrophile leukopenia. On the other hand, the few cases without leukopenia come closer to infectious mononucleosis, and in Skiles' case Vincent's organisms were found in the angina. Agranulocytic angina is said to occur chiefly in middle-aged or elderly women. That the infection is chiefly in the throat and mouth helps to cause confusion with infectious mononucleosis, scurvy and acute leukemia, especially if the latter be in the stage with little or no increase of white cells. Anemia has been present in only a few of the reported cases of agranulocytic angina. *B. pyocyaneus* has been found in the throat lesions of several cases and in the blood in one. The syndrome agranulocytic angina, according to Schenk and Pepper, apparently does not deserve to be considered a special entity, but merely one type of reaction to severe infection.

**SYMPTOMS.**—Reviewing 43 reported cases, G. J. Kastlin (Amer. Jour. Med. Sci., June, 1927) found the symptoms distributed thus: Fever, 43 cases; sore throat, 32; dysphagia,

25; jaundice, 25; malaise, 14; chills, 10; herpes, 5; headache, 4; muscle pains, 4; vomiting, 3; bleeding from mucous membrane, 2. The mode of onset was acute, coming in a period of good health, in 28. In the remaining 15, the acute manifestations occurred after a protracted period of ill health or following definite illness. The fever at the onset ranged from 101° to 105° F. Exhaustion not infrequently was seen early in the disease, and coma often preceded death. There may be regional adenopathy and enlargement of the liver and spleen. There were 3 recoveries out of the 43 cases. The average duration of illness was 4 to 8 days; the extremes were 2 to 42 days. In the few cases which recover, the blood picture returns to normal.

Agranulocytosis in a man aged 30 has been reported by H. Vos and T. A. Staal (Ned. Tijds. v. Gen., May 28, 1927). He came to the clinic complaining of sore throat and weakness. Throat and general symptoms had been present for 3 weeks. The rectal temperature was 105° F. (40.5° C.). The blood showed 2,500,000 red cells and 3000 leukocytes, with absence of polymorphonuclears and of myelocytes. At the time of death, 2 days later, the blood showed 1400 leukocytes, consisting of small lymphocytes, 92.5 per cent.; large lymphocytes, 3.5; polymorphonuclear leukocytes, 2.5, and myelocytes, 1.5. At the autopsy the bone marrow was found to contain few cells, myeloblasts predominating, with lymphocytes scattered sparsely. The leukopoietic function of the marrow is thus greatly impaired in this disorder. The tonsils are not of etiologic importance, according to the writer,



and the gangrene and sepsis are secondary.

Schultz (Deut. med. Woch., July 15, 1927) likewise considers that the tonsil is only a point of localization of the disease, and not the portal of entry. In a case with recovery which he reports, the tonsillitis appeared late. Reduced resistance of the leukocytes to sodium carbonate solutions was found in this case, and also in cases of other disorders attended with leukopenia, *e.g.*, typhoid fever.

**ETIOLOGY.**—Of the 43 cases reviewed by Kastlin, 34, or 78 per cent., were in females, and 9, or 22 per cent., in males. The age of the females averaged 46, and of the males, 29. The extremes of age were 4½ years and 74 years. There were negative past histories in 27 cases, while 16 had a history of previous illness, such as earlier oral infection, typhus, tuberculosis, syphilis, pneumonia, operations, rheumatism, etc.

Cultures from the oral cavity showed no uniformity of organisms. Vincent's spirochetes were found by several observers, pneumococcus, *B. pyocyaneus* and the Klebs-Loeffler bacillus by 1 or 2 authors. From the blood, streptococci, staphylococci, *B. pyocyaneus* and *B. coli* have been cultivated.

J. H. Skiles (Jour. Amer. Med. Assoc., Jan. 31, 1925) has expressed the opinion that the disorder may be due to either 1 of 2 causes, *viz.*, a specific infection resulting in local necrosis with the formation of a specific toxin acting on the bone marrow, or, a primary affection of the bone marrow resulting in inhibition of the formation of granulocytes (granular leukocytes) therein, due to lowering of the resistance of the patient. Kastlin (*loc. cit.*) agrees that the blood

changes in agranulocytosis are the result of the primary action of an unknown etiologic agent on the bone marrow.

According to Kwasniewski and Henning (Deut. med. Woch., Feb. 12, 1926), who report 8 cases, a common origin for both the tonsillitis and the generalized disturbance of the lymphatic apparatus is suggested by the fact that the latter may occur without the former.

Two cases of agranulocytic angina and 2 of acute leukemia associated with or following the removal of teeth have been reported by H. P. Hill (Cal. and West. Med., Nov., 1926). A woman aged 46 had some impacted molars removed. Six days later there was hemorrhage from a tooth socket, and 3 days after this, slight fever, with a leukocyte count of 2000, consisting of 96 per cent. lymphocytes and 4 per cent. transitionals. The disease ran a toxic course, the tooth cavities becoming gangrenous. A patch of exudate developed on 1 tonsil, and a few vesicles on the hard palate; icterus supervened. Smears from the teeth cavities and tonsils showed Vincent's organisms and streptococci, and cultures showed non-hemolytic streptococci, *Staphylococcus albus* and *B. coli*. Death occurred in 25 days. The teeth extracted were vital and free of apical infection. Another woman showed a similar clinical and blood picture following extraction of 8 infected teeth, but later the leukocytic count and picture improved and recovery occurred. In 1 of the 2 cases of fatal acute leukemia following dental extractions, an added extensive Vincent's infection of the mouth and throat existed. The writer concludes that agranulocytic angina and acute leukemia are probably closely related

and due to the action of infections directly or through their toxins on the hematopoietic organs, particularly the bone marrow. The type of infection or the reaction of the individual may determine the kind of response. Investigations should be carried out to ascertain if there is a relationship between the opening of avenues of infection into bony tissue, particularly in the chiselling away of portions of the alveolar process, and diseases attended with disturbance of the bone marrow.

F. H. Linthicum (Cal. and West. Med., July, 1927) reports a fatal case of agranulocytic angina in which *B. pyocyaneus* was found in the thick, gray exudate covering various areas of the mouth. Another case was similar to those of Hill [see above]. Following extraction of a number of teeth in a middle-aged woman, a gangrenous process in the mouth and nose developed. The leukocytes numbered 1400, with only 3 per cent. of granular cells. The blood picture persisted throughout the febrile course of the illness, which lasted 2 weeks. It then gradually returned to normal, clinical recovery taking place. *B. pyocyaneus* was not found in this case.

**PATHOLOGY.**—In the 43 cases analyzed by Kastlin (*loc. cit.*), the mouth always showed an inflammatory process. Ulceration and necrosis were most frequent. Necrosis involved the tonsil in 19; throat, 13; gums, 9; tongue, 6; larynx, 5; esophagus, 2. A membrane was present in 25; in 24 it involved the tonsils, and in 13 it extended to adjoining areas. It was frequently attached to non-ulcerated surfaces. Extraoral ulcerations were present as follows: Stomach, 9; vagina, 8; ileum, 6;

colon, 5; anus, 4; duodenum, 2; rectum, 2; cervix, 2; symphysis, 2; hip, 1; conjunctiva, 1. Cutaneous petechial hemorrhages or evidence of hemorrhagic diathesis were clinically noted in 8 cases, while visceral petechial hemorrhages were found at autopsy in 12 cases. The blood platelet count, recorded in 27 cases, was normal in 20.

Regional lymph-node enlargement was noted in 15 cases. It was occasionally unilateral, and only twice attended with tenderness. The microscopic picture of the lymph-nodes was variously reported as exhibiting small hemorrhages or endothelial-cell hyperplasia. The liver alone was enlarged in 5, the spleen alone in 7, and both in 7. Evidence of lymphoid metaplasia was infrequently seen. The spleens of 13 cases showed an endothelial-cell proliferation.

As for the blood, neutrophilic leukopenia with relative lymphocytosis is always seen. The decrease of polymorphonuclear leukocytes is both relative and actual. As for the mode of production of this change, the finding of granular cell decrease in the bone marrow at autopsy is significant. Zadek, Schultz and Jacobowitz in 3 cases removed bone marrow from the sternum during the height of the disease and found the same condition. A few cases, however, with a fatty marrow in the gross, have shown little or no granular cell decrease. The total number of lymphocytes is reduced or remains normal, but the relative proportion is increased.

Reticulo-endothelial cells are increased in the spleen, lymph-nodes, bone marrow, and circulating blood. Some endothelial cells are seen to be

phagocytic, and in the absence of the polymorphonuclears remain as the chief combatants to infection. In 3 cases admitted to hospital for other conditions and studied from the start, the changes in the blood uniformly appeared prior to the mouth gangrene. There being a disturbed balance between the demand and production of blood cells (Bantz), there is lack of resistance to infection, and necrotic lesions develop in locations harboring infective organisms. The inflammatory sites show a lack of cellular response to the disturbance. In fatal pneumonia in these cases the extensive fibrinous and hemorrhagic exudate is almost acellular (Kastlin).

In a case reported by Prendergast (Can. Med. Assoc. Jour., Apr., 1927), no polymorphonuclears or granular cells of any sort were seen. There were 90 per cent. of apparently normal small lymphocytes and 10 per cent. of large lymphocytes. The leukocyte count was 10,000 and the hemoglobin, 25 per cent. The erythrocytes appeared pale, and the platelets decreased in number.

Among 29,498 miscellaneous patients, Feer (Schweiz. med. Woch., June 5, 1926) found leukocyte counts below 3000 in 186, or 0.63 per cent. Of 13 cases with counts below 1000, all died soon after, except 1 patient with Banti's disease. According to this observer, agranulocytic angina is merely one form of sepsis.

**DIAGNOSIS.**—This rests on the blood examination, which shows a marked reduction or absence of the polymorphonuclear cells. Discussing the differential diagnosis, Kastlin mentions the following:

Acute poisoning by *thorium*, *arsenic*, *benzol* and the *Röntgen rays*. These agents may produce leukopenia, and

benzol attacks primarily the granulocytic cells. The poisons are ruled out by a careful history of the case.

*Acute leukemia* of fulminant type shows a somewhat similar onset, including stomatitis. Bleeding from mucosæ and petechial hemorrhages are, however, constant and usually precede gangrene. There is a leukocytosis above 50,000, and abnormal lymphocytes are always seen. At autopsy, cellular infiltration is widespread and always present. In agranulocytic angina, jaundice is seen in  $\frac{1}{2}$  the cases.

*Leukemic leukemia* shows the clinical characteristics of ordinary leukemia. The blood cell count is low or below normal. There is a relative lymphocytosis with immature and abnormal lymphoid forms and decrease of granular cells. Later, the blood picture usually tends to assume the leukemic form. At autopsy lymphoid infiltrations of organs are almost always found. Sometimes a positive differentiation from agranulocytic angina must rest on the autopsy findings.

Cases of *sepsis* have been described showing neutrophilic leukopenia, relative lymphocytosis, gangrenous stomatitis, hemorrhagic diathesis, anemia, thrombopenia, positive blood cultures, foci of sepsis at autopsy, and a clinical course similar to that of agranulocytic angina. Few cases of the latter condition, however, have shown positive blood cultures, and at autopsy septic splenitis is absent. Jaundice is uncommon in the cases of sepsis.

While agranulocytic angina does not fall within the classification of the conditions above enumerated, Kastlin does not believe that with the evidence available it can as yet

be recognized as a separate clinical entity. With the etiology unknown, collection and correlation of many more cases with autopsy will be necessary to this end.

J. Mouzon (Presse méd., Oct. 9, 1926), describing the disorder mainly on the basis of the original contribution by W. Schultz in 1922, states that the blood picture is neither that of aplastic anemia nor that of acute leukemia. The erythrocyte count and hemoglobin are not far from normal; likewise, the platelets. There is no change in the clotting time, retraction of the clot, nor the bleeding time. The leukocyte count falls to an exceedingly low level, frequently only a few hundred being found; in a few instances, in the final stage, no leukocytes at all could be discovered. The polymorphonuclears are few, and there are no eosinophiles nor mast cells. R. Schaefer (Deut. Arch. f. klin. Med., May, 1926) has reported the case of a man of 46 who recovered from a rather typical agranulocytic angina (under intravenous **neoarsphenamin** treatment), only to succumb 2 months later to an acute leukemia (with the leukocytes numbering 70,100).

**TREATMENT.**—No effective treatment is known. **Arsphenamin** intravenously, **tartar emetic** intravenously, and **diphtheria antitoxin** have been used. Ashworth and Maphis (Va. Med. Mthly., July, 1927), in the fatal case they report, gave 40,000 units of diphtheria antitoxin in 2 doses, practised **saline hypodermoclysis** (1000 c.c.), and administered symptomatically **opiates**, **strophanthin**, **adrenalin chloride**, and **caffeine sodio-benzoate**. Kastlin (*loc. cit.*), in a case already in a terminal state, gave 0.3 Gm. of

arsphenamin intravenously; the patient died 1 hour later. Local treatment of the throat has varied widely in the hands of different observers, and proven unavailing.

**ANGINA PECTORIS.—SYMPTOMS.**—The importance of *premonitory symptoms* of angina pectoris is brought out by M. H. Kahn (Amer. Jour. Med. Sci., Sept., 1926). Of 82 cases, 25, or 30 per cent., presented such symptoms. Ten had a sub-sternal or epigastric burning sensation, or both. Four had attacks of non-anginal character, *e.g.*, sudden weakness, faintness, or darkness before the eyes, and falling to the ground without loss of consciousness. Two cases had cardiac asthma with **pulsus alternans**, and 2 others, cerebral thrombosis with hemiplegia. Seven cases had dyspnea, palpitation and fatigue on moderate exertion, with other signs and symptoms of myocardial impairment, before the onset of angina pectoris. Evidently there is early involvement of the aorta and coronaries long before anginal symptoms develop; hence the need, for the prevention of angina pectoris, of giving careful attention to premonitory symptoms.

In an analysis of 253 cases complaining of pain in the region of the heart, E. S. Kilgore (Jour. Amer. Med. Assoc., Aug. 14, 1926) found that, of 36 cases believed to be genuine angina, only 4 described *lancinating pain*, and in only 1 of these was it unassociated with other pain suggesting the compression ("vise-like," "cramping," "clamping") quality—in this particular case, furthermore, the later history threw some doubt on the original diagnosis. *Lancinating pain*



is highly characteristic of *pseudo-angina*. Such sharp, shooting pain usually ceases abruptly in 1 to several seconds; it may, if severe, be followed by a dull, diffuse pain, and often by increased skin sensitiveness. It usually does not radiate, but may do so along the ulnar distribution or elsewhere, occasionally synchronizing with the heart-beats. Effort, mental excitation and meals seldom seem to precipitate it. Certain motions of the left arm or trunk, or turning a certain way in bed, can occasionally be counted on to produce it. In the writer's series it proved to be the commonest type of precordial pain.

J. Phillips (South. Med. Jour., Feb., 1926) states that occasionally an angina patient will complain of a distressing sense of pressure and pain between the shoulders at the level of the 2d to the 5th dorsal vertebræ. This pain has seemed to the writer to be of unfavorable prognostic portent. In 2 cases neuralgia of the lower jaw was associated with anginal attacks, and all the lower teeth had been vainly extracted. In 1 case pain was referred to the testicles. A woman of 52 who had had several typical seizures later had 2 attacks of agonizing pain simulating renal colic; following each of these the left breast and pectoral muscle were extremely sensitive, with cutaneous hyperesthesia; X-ray study and cystoscopy failed to reveal any kidney stone. In patients with or without high blood-pressure in whom the second sound of the aorta has a tympanitic or bell-like quality, the possibility that an anginal attack may occur should be kept in mind, as this sign indicates sclerosis of the aortic arch, so that

the openings of the coronaries may be encroached upon. Particularly significant is a tympanitic aortic second sound associated with a low pulse pressure.

According to M. H. Kahn (Amer. Jour. Med. Sci., Mar., 1927), *tender spots* constitute an important and significant sign in angina pectoris. Of 55 cases of angina examined, 48 had tender spots along the ribs or on pressure over the sternum. The sign was found positive in non-anginal cases in which there was aortic or myocardial disease, but never in persons without heart involvement. In angina, the tender spots are most often located on the 2d, 3d and 4th ribs to the left of the sternum (4th cervical and 2d and 3d thoracic), and over the 2d and 3d ribs in the outer part of the right pectoral region (4th cervical). The tender spots persist for a long time after an attack, and sometimes continue throughout the intervals between attacks. They are especially valuable in the differential diagnosis between myocardial lesions and disease of the upper abdominal viscera.

Seven cases of angina pectoris combined with *severe anemia* have been observed by Herrick (Amer. Heart Jour., Apr., 1927). Of the 3 most recent cases, 1 had typical pernicious anemia and angina of effort. The 2d was a man of 70, non-syphilitic, who showed evidence of vascular and myocardial degeneration, *viz.*, dyspnea, often nocturnal, many premature contractions, and characteristic substernal pains on walking. After more than a year of cardiovascular disturbance, an anemia with pernicious characteristics became manifest, and was the immediate cause of death. In the 3d case, with severe secondary anemia, the autopsy showed carcinoma of the right kidney, metastases in the liver,

lung and glands, gall-stones, marked senile sclerosis of the aorta and coronaries, and fatty infiltration of the myocardium, with areas of fibrosis.

### ETIOLOGY AND PATHO- GENESIS.

—The etiologic factors in 82 cases of angina pectoris were investigated by M. H. Kahn (Amer. Jour. Med. Sci., Aug., 1926). Almost 25 per cent. had had their first typical attack before the age of 40 years. Tobacco and alcohol could not be excluded as contributory factors. Sudden excessive strain was found to be the most important immediate factor preceding the attack, especially in individuals engaged in moderate or sedentary occupations. Acute infectious causes such as rheumatism and infected tonsils appeared to be important in initiating changes in the aorta and coronaries. In only 3 cases was syphilis a factor. Diabetes was present in 10 cases, and gall-bladder disease in 3 cases. There was no direct etiologic relation between arterial pressure and the attacks. It is interesting to note how frequently patients with extremely high arterial tension will remain free from chest pain or angina pectoris. Electrocardiographic changes are found promptly after an attack of angina pectoris and often precede it; this would indicate early myocardial involvement. J. Phillips (South. Med. Jour., Feb., 1926) states that tobacco was used to excess by 86 of his 130 male patients. The blood-pressure (classified as high if the systolic exceeded 140 and the diastolic 90, and as low if below 100 and 60, respectively) was high in 94 cases, normal in 70, and low in 10. The Wassermann, where taken, was negative in 111 and positive in 3. J. M. Anders (Weekly

Roster and Med. Dig., Jan. 1, 1927) asserts that since an organic lesion of the heart is not essential to the production of angina pectoris, one may safely assume that an abnormally sensitive nervous system may stand in causative relationship. Of his 103 cases, 47 showed premonitory symptoms, *viz.*, dyspnea on exertion, 30; precordial distress with constriction or burning on exertion, 8; palpitation, 5; sudden general weakness and faintness, 4; pain in left arm, 1. Appropriate treatment may cause these prodromal symptoms permanently to disappear.

Eight cases of angina pectoris in persons below 30 years of age, all with aortic regurgitation of rheumatic origin, are reported by P. D. White and S. G. Mudd (Amer. Heart Jour., Oct., 1927). Only 42 other cases in persons below 30 could be found in the literature. Coronary occlusion by thrombosis or embolism is even rarer (by about 10 to 1) at that age.

The occurrence of angina pectoris in patients with *myxedema* is discussed by C. C. Sturgis (Boston Med. and Surg. Jour., Aug. 19, 1926). In about  $\frac{1}{2}$  of all myxedematous patients, necropsy shows extensive atheroma of the aorta and endarteritis of the small arteries all over the body. In patients with myxedema and angina thyroid must be used with the utmost caution, as the strain imposed on the myocardium by the resulting call for increased function may result in serious symptoms and even death. Doses not exceeding 0.03 Gm. ( $\frac{1}{2}$  grain) a day should be continued for months; improvement in the symptoms of myxedema may under these conditions be slow, but it is the only safe procedure to follow.

In regard to the *mechanism of pain*

production in angina pectoris, W. D. Reid (Boston Med. and Surg. Jour., Jan. 28, 1926) points out that normally during exercise there is a dilatation of the peripheral blood-vessels, produced, in large part at least, by the coöperation of the nervous system, probably by a reflex through the depressor fibers of the vagus. He suggests that the sequence of events in angina pectoris may well be a failure of this reflex dilatation, with resulting sudden rise, on exertion, of the pressure in the 1st part of the aorta and the cavity of the left ventricle, this heightened pressure, in turn, irritating the local nerve end-plates. This is in harmony with the fact that angina is commonly associated with 3 types of heart disease, *viz.*, arteriosclerotic heart disease, cardiovascular syphilis, and hypertensive heart disease. In arteriosclerosis the peripheral vessels are known to be less elastic. In cardiovascular syphilis there are lesions in the aorta and ventricular muscle. In chronic hypertensive conditions the same changes may occur, and for some unknown reason, there is marked tendency to constriction of the smaller vessels in the periphery. It is believed that at least part of the anginal syndrome may occur in normal persons during strenuous exertion, as illustrated in the burning or almost agonizing pain at the base of the neck when running to one's limit, before obtaining the "second wind." In trained athletes the protective mechanism of dilatation of the peripheral blood-vessels tends to prevent this gripping pain.

According to E. Wolff (Berl. klin. Woch., Sept. 3, 1927), the pain is induced thus: Because of some sudden

increase of resistance in the peripheral circulation or a suddenly augmented influx of blood into the heart, residues occur in the left ventricle, which becomes distended, and the intraventricular pressure rises. The heart is stimulated to stronger contractions, and these are capable of interrupting the coronary circulation through compression. Stasis of blood in and distention of the proximal portion of the coronaries and aorta are thus produced, the pain resulting.

In 3 cases seen by C. Thompson (Ky. Med. Jour., Oct., 1927), intermittent claudication preceded all other symptoms, the anginal symptoms not appearing till over a year later.

J. A. Ryle (Lancet, May 1, 1926) enumerates 9 arguments which appear to him to weigh heavily in favor of an aortic or coronary, or at least an arterial, origin of the pain. He argues, furthermore, that the increased tension in the walls of the aorta or coronaries, or both, which causes pain, is due not to spasm but to a failure to relax in the face of the higher pressures attending increased cardiac work. In status anginosus, as in popliteal embolism, the pain is agonizing and sustained, the vessels being structurally damaged and the parts supplied undergoing ischemic necrosis. A similar analogy exists between ordinary angina pectoris and angina cruris (intermittent claudication), both being conditions in which the patient is "pulled up" and prevented from walking further by a severe but passing pain from which he is free at rest—a pain due probably to a loss of resiliency and adaptability in the vessel wall. There are "functional" types of both condi-

tions, dependent on a neuromuscular disturbance; in some of the writer's cases, tobacco or emotion seemed to be the underlying cause.

Clinical evidence adduced by R. C. Shaw (Brit. Med. Jour., June 11, 1927) suggests that the anginal syndrome is principally the sum of the irritation of several nervous paths. Certain features indicate direct organic interference with these paths. Angina is probably due to a nervous lesion located in the region of the lower cervical or upper thoracic cord, the associated ganglia or their connections, exciting secondary pathologic changes in the cardio-aortic region. This would justify surgical intervention in suitable cases from the theoretic standpoint. C. Thompson (*loc. cit.*) refers to Mackenzie's view of a hypersensitive region of the spinal cord in angina. Irritability of the spinal centers accounts for anginal attacks when extra demands are made on the heart muscles, for attacks induced by movements of the left arm, and for the spasm of the chest muscles, while hyperexcitability of the nuclei in the floor of the 4th ventricle accounts for the nausea and increased flow of saliva seen in many cases.

**PROGNOSIS.**—In a study of 200 cases, P. D. White (Jour. Amer. Med. Assoc., Nov. 6, 1926) found that the age at onset had little to do with the duration of the disease. In Mackenzie's series of 213 cases, the average duration to death was 5.4 years, but the series included a few cases of coronary thrombosis without angina pectoris, hence the average duration for the angina alone should doubtless be a little longer. Hypertension, coronary thrombosis, syphilis, evident arteriosclerosis, poor

heart-sounds, abnormal T wave in the electrocardiogram, and especially cardiac enlargement, are more often found in angina patients who succumb within a few years than in those who survive. As a rule, the more severe the pain, the worse the prognosis. The prognosis is fairly good if physical examination of the heart, blood-pressure and electrocardiogram are all normal; cases well treated in general do better, and those with a better prognosis often show an unusually sensitive nervous system. A quiet trip south to avoid the severe New England winters adds years to the lives of many; sea trips at critical times frequently achieve the same result, and even an accident or operation, if not too severe, may be a blessing in disguise by enforcing rest in bed for a time. Tobacco in some cases had absolutely no effect; in others there was sometimes an aggravation of the angina. Like individual considerations apply to coffee and tea. Any patient with angina will do better by avoiding hurry, worry, overexertion, overeating, and very bad, cold or stormy weather.

In *coronary thrombosis*, patients often survive for years in good or fair condition. The average duration of life in White's 62 cases ( $\frac{1}{2}$  of them still alive) was close to 2 years. Poor heart-sounds and congestive failure added to the gravity of the prognosis, while sex, age, hypertension, evident sclerosis, syphilis, fever, and paroxysmal auricular fibrillation had little or no influence on it. The electrocardiogram did not help, though the very slow pulse of complete heart-block was a bad sign. Neither the previous occurrence of angina pectoris nor its duration prior to the attack of coro-



nary thrombosis seemed of prognostic significance.

As noted by J. Phillips (*loc. cit.*), F. Smith has shown that in dogs, when large branches of the coronaries are ligated, the amplitude of the QRS complex is diminished, and the limbs are often notched. At the same time the T wave is inverted in 1 or more leads, is increased in size, and may arise from the descending limb before the isoelectric point is reached. In man similar curves have been recorded after coronary occlusion. Thus, changes in the amplitude of the QRS complex, increase in the QRS interval, and inversion of T wave are of serious prognostic significance.

Of 27 cases seen by Hutcheson (Va. Med. Mthly., May, 1927) in 3 years in which the clinical manifestations pointed definitely to *coronary thrombosis with cardiac infarction*, 17 died in or soon after the attack, and 10 recovered. In the 14 cases in which electrocardiograms were obtained, all showed significant changes in the ventricular complexes, varying from a bundle branch block to inversion of the T wave in leads I or II or both. In all cases later traced, there was apparent lessening of cardiac reserve following recovery from infarction. The writer saw infarction twice *post mortem* in hearts that had not given characteristic evidence of it during life; there had, however, been sudden onset of heart failure, in 1 instance with auricular fibrillation.

**TREATMENT.**—For the attack, White (*loc. cit.*) finds **nitroglycerin**, in a  $\frac{1}{100}$  grain (0.006 Gm.) soft tablet, the most satisfactory drug. Allowed to dissolve under the tip of the tongue, it passes into the general circulation without having to go through the capillary system of the liver, and should act in 3 to 5 minutes. A second tablet may be given in 10 minutes, if needed, and the drug should be pushed until the attack is

relieved or there is beginning headache or facial flushing. While inhalation of **amyl nitrite** is preferred by certain patients, some physicians do not use it in chronic arterial hypertension because it may produce a secondary rise of blood-pressure beyond the preëxisting level. **Morphine** may well be restricted to the purpose of quieting the patient, and in this connection its oral use is satisfactory. It is really needed, however, in the continuous pain of coronary infarction. **Rest** is indicated until 1 or 2 days have passed without attacks, but the writer does not favor long periods in bed where the attacks have ceased, prolonged restriction to bed in the elderly being harmful in the loss of muscular strength and definite danger of hypostatic pneumonia.

Between attacks, if there is a tendency to flatulence, the patient should be given **compound spirit of ether**, either alone or in a mixture in equal parts with **aromatic spirit of ammonia** and **spirit of chloroform**, 30 minims (2 c.c.) of each of the 3, to be taken in 2 or more volumes of hot water. In elderly men with enlarged prostates, an attack may be started by distention of the bladder; measures should be taken to prevent this, *e.g.*, use of the **catheter** before the bladder has become overfilled. The suggestion that the patient start walking slowly and walk at his normal rate only after this preliminary "warming up" may enable him to engage in this beneficial exercise. It is often advisable for him to take nitroglycerin just before any necessary exertion. While he should carry nitrites with him (nitroglycerin to be renewed weekly), the writer

lacks faith in continuous interval treatment with nitrites. The underlying heart disease should be investigated and treated. In patients below 50, without hypertension, **mercury** and **potassium iodide** often prove very beneficial, the attacks ceasing permanently. Arteriosclerosis or chronic hypertension, where present, call for appropriate treatment; in the latter instance, a diet rich in calcium (milk and leafy vegetables) and vitamins, sunlight, and calcium salts are advised.

For obviating further attacks, Anders (*loc. cit.*) endorses absolute **rest in bed** for 1 to 2 months. In a few of his cases, the attacks were thus permanently arrested. A positive Wassermann calls for **arsphenamin**, at first in small doses, gradually increased to the average dose, and always to be followed by **mercury**. In arteriosclerotics, **potassium** or **sodium iodide** is most useful, beginning with not over 5 drops of a saturated solution. **Nitroglycerin** is also serviceable, tending to soften the walls of the hardened vessels.

Where, in the attack, nitrites fail to relieve in 3 or 4 minutes, Phillips (*loc. cit.*) gives **morphine sulphate**,  $\frac{1}{4}$  grain (0.015 Gm.), and **atropine sulphate**,  $\frac{1}{150}$  grain (0.0004 Gm.), hypodermically. The morphine may have to be repeated up to 1 grain (0.06 Gm.), the atropine, however, not being repeated. A **mustard plaster** may be applied over the chest. The chest soreness after an attack may be quickly relieved with **acetylsalicylic acid**, 5 to 10 grains (0.3 to 0.6 Gm.). The patient should remain in bed 1 to 4 weeks if the attack has been severe and especially if there is evidence of myocardial impairment.

**Sodium bromide**, 15 grains (1 Gm.) 3 or 4 times a day for several days after an attack, is useful to relieve anxiety and promote rest and sleep. For myocardial weakness, **digitalis** tincture, 10 to 20 minims (0.6 to 1.2 c.c.) 3 or 4 times a day, should be given for several weeks. An obese patient should be reduced by limiting his diet to 1000 calories a day. Tobacco should be stopped, or at most only 1 mild cigar a day allowed. Constipation should be regulated by diet and simple laxatives such as **casarea**, **senna** or **phenolphthalein**. Catharsis every second week with **calomel** or **blue mass** followed by a saline is frequently advisable. Optimism should be imparted to the apprehensive patient; the physician may dwell upon the case of John Hunter, who lived for 20 years and did much of his best work after his 1st attack. When the patient resumes activity, living within his reduced cardiac reserve (*e.g.*, 60 to 80 per cent. of normal), he should rest 2 hours each afternoon; if unable to exercise, he should have **massage** 3 times a week.

According to A. Sézary (Bull. Soc. méd. des hôp. de Paris, July 1, 1926), **phenobarbital**, in the dosage of  $1\frac{1}{2}$  to  $4\frac{1}{2}$  grains (0.1 to 0.3 Gm.) a day, usually exerts a prompt, though sometimes a slow, effect in cutting down the frequency and severity of the attacks. Where the drug is stopped after improvement has occurred, a recrudescence may take place after a few weeks or months, proving that the drug had been helpful. In an illustrative case, in a woman of 60 years with high blood-pressure (S. 240; D. 120), antisyphilitic treatment had proved only temporarily useful. Upon taking 3 tablets of  $\frac{3}{4}$  grain (0.05 Gm.)

of phenobarbital daily—on awaking,  $\frac{1}{2}$  hour before lunch, and on retiring,—the attacks, which were occurring at least 3 times a day, abruptly diminished, and after 4 weeks ceased entirely, although the blood-pressure remained the same, and although the dosage was reduced to 1 tablet a day. When the drug was stopped there were no attacks for 8 months, after which a few attacks recurred, but ceased under 1 tablet a day. Some months later, following a period of great stress, the attacks recurred with the same severity as before treatment, but yielded promptly to 3 tablets a day. J. A. Flexner (Ky. Med. Jour., Oct., 1927) has also had gratifying effects from phenobarbital in several cases. In 1 instance, in which the attacks were sometimes nocturnal and often epileptoid in character, giving this drug permitted of discontinuing morphine, of which 1 to 3 injections had been required to control the attacks at night.

Gubergritz (Zeit. f. Kreisl., xix, 89, 1927) states that therapeutic fever induced by injection of **tuberculin** has given some good results in angina pectoris. Avoidance of cold and **diathermy** may prolong life. In the attack, when **morphine** is used, it should be combined with **atropine** or **papaverine**. In cases with high blood-pressure, **venesection** may be useful. F. Brunn (Wien. klin. Woch., Oct. 13, 1927) finds that where angina and cardiac asthma coexist, all the symptoms disappear upon injection of **pituitary extract**. Angina alone, however, is not benefited, or may even be made worse.

In a case reported by L. Ambard, F. Schmid and F. Humbert (Bull. Soc. méd. des hôp. de Paris, Nov. 11, 1926),

a man in the sixties had had anginal symptoms of varying degree for 12 years. His blood-pressure had been S. 175 and D. 90, with slight albuminuria, and a **salt-free diet** had several times been beneficial. Lately the condition had grown worse, so that there was a constant gripping sensation and he had to stop after walking a few steps. After he had been in this state for 2 months, 10 units of **insulin** were given daily. By the 4th day there was definite improvement, and by the 8th day he could walk without stopping to his office, which he had not been able to do for a long time. Two weeks later the improvement was still maintained.

In view of some striking results obtained by **diathermy** in intermittent claudication, John Hay and P. Ince (Lancet, Oct. 16, 1926) employed the method in 8 cases of angina pectoris. Usually the current was passed through the thorax from front to back. The amperage was from 1.5 to 2, usually for 30 minutes from thrice to 6 times weekly. Apart from the subjective improvement resulting in all but 1 case, and the lowering of blood-pressure, the capacity for effort was increased, pain and dyspnea being much less readily induced. The patients were enabled to live more normal lives.

Improvement of 1 case by **X-ray** therapy is reported by Ecker (Radiol., Feb., 1927). After treatment the patient still had pain after exertion or emotion, but there was no transmission to the arm, and the attacks were promptly relieved by nitroglycerin. The pain was much less severe and frequent, and unattended with angor. The rays were directed to the lower cervical and upper 5 thoracic vertebræ. The dose was 5 ma. with 9-inch gap at a distance of 10 inches through 5 mm. of aluminum for 6 minutes. The intervals between treatments ranged from 10 days to 4 weeks, and the

treatment had been repeated 12 times to date.

**Paravertebral alcohol block** was used with marked success for severe pain in 5 cases by G. I. Swetlow and S. P. Schwartz (Jour. Amer. Med. Assoc., May 29, 1926). The site of the injection is determined by mapping out skin areas of hyperesthesia, hyperalgesia and hyperthermesthesia on the chest wall. The nerve roots and dorsal root ganglia supplying the areas of increased sensibility are presumed to be the ones kept irritated by the bombardment of afferent impulses from the heart. With the usual technic of paravertebral injections, 3 to 5 c.c. (48 to 80 minims) of 85 per cent. alcohol are injected into the nerve roots selected. In the Case 1, injections were made into the 4th, 5th, 6th and 7th dorsal roots on the left side; Case 2, into the 3d, 4th, 5th and 7th, and 4 months later into the 1st to the 4th; Case 3, into the 3d, 5th, 7th and 9th; Case 4, into the 1st and 2d; Case 5, into the 2d, 3d, 4th and 5th. Case 1 was still free from pain 6 months after injection. Case 2 required further injection after 4 months. Case 3 was relieved 14 weeks, until death from decompensation, and Case 5, 9 weeks, until death from pulmonary edema. Case 4 was not completely relieved, but had no further attacks of nocturnal pain. The procedure is advocated as an efficacious, simple and harmless method of alleviating severe cardiac pain.

The above procedure is commended by T. G. Schnabel (Atlantic Med. Jour., Jan., 1927) on the basis of 1 case, in which satisfactory relief was obtained. Chest hyperalgesia was universal. The 2d, 3d and 4th nerves on the left side were first injected,

and 10 days later, as there had been some return of pain, the 4th, 5th, 6th and 7th. Thereafter the man had no more severe pain, though experiencing much dyspnea. Describing the procedure, the writer notes that, for injection, the patient should lie on the side opposite to that to be injected. Points for injection are selected over the ribs above the intercostal spaces to be injected, such points being 4 cm. ( $1\frac{3}{5}$  inches) from the midline of the back. Wheals are made with 2 per cent. novocaine solution, and through them an 8 cm. ( $3\frac{1}{5}$  inch) needle is inserted perpendicular to the posterior surface of the rib. When the point touches the rib, the needle is slightly withdrawn and so directed that it points  $45^\circ$  inward, downward and forward. It is further inserted for a distance of 2 cm. ( $\frac{4}{5}$  inch) from the lower edge of the rib. A water manometer is now attached to the needle to make certain that it has not penetrated the pleural cavity. Three to 5 c.c. (48 to 80 minims) of the novocaine solution are then injected, and after about 5 minutes, 3 c.c. of warmed 80 per cent. alcohol. Half of the latter is injected without moving the needle; the remainder, while the needle is moved slightly to and fro.

**Surgical Treatment.**—Interest in operative procedures for angina pectoris has somewhat diminished. As noted by M. G. Seelig (Amer. Jour. of Surg., Oct., 1927), a survey of the literature at once elicits conflicting opinions. No less than 10 procedures have been devised: Cervical sympathectomy with resection of the stellate ganglion; section of the depressor nerve; paravertebral block; section of fibers emerging from the vagus; sec-



tion of the rami communicantes arising from the stellate ganglion; section of the cervical sympathetic above the lowest ganglion with section of the vertebral nerve; section of the sympathetic nerve above the stellate ganglion; cervical sympathectomy without resection of the stellate ganglion; resection of the cervical sympathetic cord with resection of the cervical vagus branches that enter the chest and certain rami communicantes; section of the cervical sympathetic together with the superior cardiac nerves. When so many operations have been devised, an attitude of reasonable doubt as to the precise value of any of them is in order.

According to an analysis by E. C. Cutler (Amer. Jour. Med. Sci., May, 1927) of the results obtained in 120 cases selected from the literature, the effects of the complete Jonnesco procedure (removal of the complete cervical chain down to and including the 1st thoracic ganglion) are better than those given by the simpler procedures involved in any of the cervical sympathectomy operations. Of the cases subjected to this operation, unilateral or bilateral, 62 per cent. were satisfactorily relieved, while 18.5 per cent. more were improved. Taking the various procedures upon the cervical sympathetic chain as a whole, 41.5 per cent. were relieved and an additional 35.8 per cent. improved. In operations involving the superior cervical ganglion or the superior cardiac nerve, only 34.5 per cent. gave a good result and altogether 72 per cent. were improved, which compares unfavorably with the results from the Jonnesco procedure. Thus, apparently, interrupting motor pathways is not so satisfactory a method of

blocking the painful attacks as interference with pathways known to be sensory in function. Yet, in some cases where the sensory pathways were blocked, and only the superior cervical ganglion remained, anginal attacks have recurred with radiation of pain into the face and neck, which is the area supplied by this ganglion; this would indicate that the motor element is a factor in some cases of angina. The operations on the depressor nerve have been too few for the drawing of conclusions, and as for destruction of the posterior roots by alcohol or operative methods, the material so far presented is not convincing, and the injection of alcohol may not be such a safe procedure as it seems. The complete Jonnesco procedure achieves part of its success because it interferes with a motor autonomic reflex besides interrupting the sensory pathways. The failure of any single procedure to alleviate the pain in all cases indicates that much more is still to be learned. The operative mortality in 27 cases of Jonnesco operation was 11.1 per cent.; in 53 cases of various types of cervical sympathectomy, 7.5 per cent., and in 12 cases of depressor nerve operation and 26 cases of posterior nerve-root procedures, *nil*. The writer comments on the great difficulty of identifying the depressor nerve in human cases, and believes there is no reason to think that it carries stimuli which might result in the pain of angina.

In another paper, Cutler (Ann. of Clin. Med., May, 1927) selects for analysis only 50 out of 155 total operations performed, these 50 comprising only cases carefully studied for 6 months after the operation. Again the results favor the complete Jon-

nesco procedure, which, with an operative mortality of only 4 per cent., yielded relief of pain for 6 months in 64 per cent., improvement in 8 per cent., and no relief in 12 per cent., with questionable results in 12 per cent. Jonnesco's operation on both sides at present offers the greatest hope of lasting relief. A unilateral Jonnesco procedure is well borne by angina patients, though in selected cases it may be wise to perform a simple superior cervical sympathectomy as a 1st stage to a later complete removal. Neither clinical nor experimental evidence justifies the suggestion of some that division of the nerve fibers concerned leads to myocardial disease or diminishes the functional capacity of the heart.

Danielopolu (Gaz. des hôp., July 9, 1927) recommends the following operation, to be performed in 2 stages: (1) Section of the sympathetic chain above the inferior cervical ganglion, and also of the vertebral nerve, of all the fibers descending parallel to the sympathetic and entering the thorax (branches of the cervical vagus entering the chest, including the depressor, and the upper and middle sympathetic cardiac nerves), and of all the rami communicantes uniting the inferior cervical ganglion and the 1st thoracic ganglion to the 4 lower cervical pairs and the 1st dorsal; this section of the rami must be carried out as near as possible to the spinal nerves, as there is an inconstant ramus communicans which, leaving the stellate ganglion, courses to the 2d dorsal pair, and which may embody an important group of efferent cardiac fibers. The operation is carried out through a small incision at the base of the neck and seems easy

to perform. It may suffice, as the writer has seen cases in which, following it, the attacks completely disappeared. Where it proves inadequate, the 2d stage is carried out, consisting of section of the cervical sympathetic chain *in situ* (without the inferior cervical ganglion) and section of the descending fibers of the vagus in the chest that may have remained uncut at the 1st operation. If, after performance of these operations on the left side, the result is still incomplete, the operation is later carried out on the right side. In the 1st week after operation the attacks are in abeyance owing to the operative shock and the anesthesia; they may then become more intense and frequent for a time, after which slow, progressive improvement occurs as the cut nerve fibers undergo degeneration. The writer mentions 12 cases of operations identical or similar to the one he describes, performed by various operators, with more or less complete clinical relief. The operation seems more effective than that involving removal of the stellate ganglion, since in several cases dealt with by Jonnesco's method failure has resulted. Death has also sometimes been attributable to the Jonnesco procedure, while no deaths have followed the writer's operation, which spares all the efferent cardiac and coronary nerve fibers, thus having no deleterious influence on the state of the myocardium. The operation is applicable even where evidences of left ventricular insufficiency have begun. In 1 such case, attacks of pulmonary edema disappeared after the operation.

In a case of bilateral cervical sympathectomy reported by M. G.

Seelig (Amer. Jour. of Surg., Oct., 1927), with the 2 stages performed 3 months apart, there occurred a major complication in the form of paralysis of the vocal cords, ascribed to anomalous adhesion of the vagi to the sympathetics and injury to the recurrent laryngeal fibers in the separation of these nerves. The patient complained bitterly of persistent dyspnea, which moderated only gradually after the vocal cords had undergone atrophy in the course of 6 weeks. The anginal pains were relieved by the operations. Death occurred from decompensation 2½ months later.

According to H. Lilienthal (Med. Jour. and Rec., June 16, 1926), angina pectoris is probably caused by tension in the ascending aorta, coronaries, or both. If this tension is due to coronary obstruction, the chances for relief by operation are not as good as in the aortalgic type. Relief by nitrites seems a test of some value in deciding upon **sympathectomy**. In a man of 62, without evidence of coronary disease but with hypertension, avulsion of the left superior cervical ganglion and removal after dissection of the sympathetic nerve and middle ganglion was followed by complete relief of pain for over 2 years. The blood-pressure dropped from 180 to 113, then rose gradually to 150. Ultimately symptoms of coronary thrombosis appeared. Of 3 other cases with hypertension exceeding 300 mm. Hg, 2 required operation on both sides; the pain recurred in 1 week to 3 months, with return of hypertension. In general, the safest surgical procedure in angina pectoris should be tried first, *e.g.*, alcohol blocking of the upper thoracic sensitive branches. The question of operation must be decided in each instance by the cardiologist, surgeon and patient.

E. Hesse (Beitr. z. klin. Chir., cxli, 321, 1927) favors **superior cervical sympathectomy**, which has given 80 per cent. of successes and a mortality of but 10 per cent. In 2 cases operated on under local anesthesia during an attack, he observed cessation of the pain on section of the sympathetic. To avoid the facial neuralgia which follows in 36 per cent. of cases of complete removal of the superior cervical ganglion, he recommends sectioning this ganglion in its middle, slightly above the origin of the superior cardiac nerve, the upper half of the ganglion being left undisturbed. He recognizes a left- and a right-sided variety of sympathicotonic angina pectoris, to be dealt with by operation on the corresponding side or, if the origin is bilateral, by a bilateral operation in 2 stages. Severe cases unrelieved by internal treatment constitute the indication for operation, which is contraindicated, however, by complete decompensation and by myocarditis. Beginning coronary occlusion or syphilitic aortitis does not contraindicate it, but in the latter condition antisiphilitic treatment should previously have been tried.

Anginal attacks in 3 middle-aged women disappeared, as related by Külbs (Klin. Woch., May 14, 1927), when the patients were relieved of disorders of the reproductive organs, *e.g.*, fibroid tumor and endometritis.

**ANGIOMA.**—Among 193 cases of hemangioma treated at the C. P. Huntington Memorial Hospital, as described by G. W. Taylor (Boston Med. and Surg. Jour., Oct. 14, 1926), 146 concerned skin and subcutaneous lesions and 57, mucous membrane lesions. As to the age of onset, there were as many appearances

after the 1st year of life as at birth or during the 1st year. Surgical **excision** is the treatment to be preferred in small accessible hemangiomas when a scar will not be disfiguring. **Radium** is successful in telangiectatic angiomas and small superficial lesions of the skin or mucosæ; moderately satisfactory in deep-seated lesions, and unsatisfactory in portwine marks and in superficial diffuse lesions. Reactions, with their sequelæ of scars and telangiectases, can largely be avoided by using only silver-screened radiation.

The radium emanation is used in capillary glass tubes, enclosed in silver cylinders of 0.5 to 1 mm. thickness, to filter out the caustic beta rays. The tube is best elevated on 0.5 or 1 cm. of wood or gauze; the area of effective action is doubled with each 0.5 cm. of elevation. It is assumed that 15 millicurie-hours of the bare (steel-jacketed) tube laid on the skin will usually cause an ulcerated area about 1 cm. wide. Half of this "ulcerative" dose, doubled for each 0.5 mm. of silver filtration and for each 0.5 mm. of elevation, is the usual 1st dose. Thus, with a tube of 90 mc., filtered with 0.5 mm. of silver and elevated 0.5 cm., the 1st dose is of 20 minutes' duration. Such a dose acts over an area 2 cm. wide and twice as long as the tube, and can be repeated on adjacent untreated areas until the whole surface of the angioma has received treatment. If no reaction nor improvement occurs, the dose can be increased cautiously up to  $\frac{3}{4}$  or  $\frac{7}{8}$  of the ulcerative dose. Uninvolved areas are protected with 1 mm. of lead covered with adhesive plaster. The usual interval between treatments is 6 weeks. The number

of treatments required averaged 2 for telangiectatic angiomas, 36 for portwine marks, 6 for circumscribed superficial angiomas, 12.5 for diffuse superficial angiomas, 11 for deep angiomas, 4 for circumscribed superficial mucosal lesions, and 16 for deep mucosal lesions.

F. E. Simpson and R. E. Flesher (Jour. Amer. Med. Assoc., Dec. 10, 1927) have abandoned freezing, caustics, X-rays, and the Kromayer lamp in the treatment of vascular nevi, and prefer **radium**, which is painless and especially desirable in dealing with young children. It is sometimes, however, slow and tedious. They use radium "toiles" of  $\frac{1}{20}$  strength, round and square radium plaques of  $\frac{1}{4}$  and  $\frac{1}{2}$  strength, and in some cases, several hundred millicuries of radon (radium emanation). "Toiles" are pieces of linen or rubber impregnated with radium sulphate, and are easily bent to conform to irregularities of surface. In flat superficial nevi, disappearing momentarily on pressure, a toile screened with 0.1 mm. of aluminum may be applied for a total exposure of 1 to 3 hours, divided into 2 or more periods. In flat, deeply infiltrating nevi, a total of 4 to 5 hours, in periods of 1 hour each, is effective. In the cavernous nevus, elevated 1 cm. or more and 1 or 2 cm. in diameter, radon tubes are often used, 250 mc. screened with 2 mm. of silver being applied at a distance of 1 cm. for a total exposure of 1 to 2 hours.

In small strawberry marks, found at or soon after birth and usually from pea to dime or quarter size, W. H. Schmidt (*ibid.*) obtains prompt good results with **desiccation**. A lesion of quarter size can be destroyed in 1 minute. Anesthesia is dispensed



with. The current is allowed to jump from the needle to the center of the angioma; thereafter, in a concentric manner, one works out to the edges of the lesion. The needle is finally brought into actual contact with the tissue, to destroy the "blood lake" under the angioma. In time, all trace of the angioma disappears.

**ANKLE.—SPRAIN.**—C. P. Hutchins (Boston Med. and Surg. Jour., July 21, 1927) deems functional use, provided it does not cause additional injury, the most effective stimulant of repair. After **cold compresses** have limited the acute inflammation, he employs a form of **strapping** which, in 23 years' experience, has always been followed by prompt repair with immediate ability to function. The patient is seated on a table so that his foot hangs 6 to 8 inches lower than the knee of the operator, who sits facing him. With adhesive straps  $1\frac{1}{2}$  inches wide cut to length, the foot is placed on the operator's knee so that the ankle is dorsally flexed to  $80-85^\circ$  from the long axis of the tibia and the full weight of the extremity rests upon the head of the 5th metatarsal. The patient's leg must be wholly passive. This leaves the leg straight from hip to ankle and throws the foot into slight eversion. The 1st strap runs spirally around the lower calf on the median side, across the instep and cuboid, under the sole, falling into a natural sweep on the dorsum. This is the salient control of the hypermobility. The 2d strap is a counterpart in the opposite direction, acting to limit eversion, and balancing the 1st. The 3rd support is a stirrup from the middle of the calf, and passes

in the lateral plane of the ankle joint. The 4th and narrow strip retains the 3rd support in contact with the leg at its isthmus above the malleoli. The patient's leg must be in the same posture throughout the dressing and his muscle action inhibited.

Walking is instituted at once, with the foot carried straight ahead. A little practice with shortened step and accelerated flexion of the knee at the completion of the stride obviates any necessity for a limp. When perspiration permits the plaster to slip so that the angle between the foot and leg exceeds  $90^\circ$ , the dressing must be reapplied. Sensitive skins require sedation and may necessitate periods of interruption from plaster. **Diathermy** accelerates repair and abbreviates dependence upon the plaster support. Daily removal of plaster is required for this treatment, preferably before retiring with reapplication in the morning.

**ANKYLOSIS.—HIP.**—In an analysis of 48 cases of *arthroplasty* for hip-joint ankylosis, W. C. Campbell (Surg., Gyn. and Obst., July, 1926) notes that arthroplasty must not be confused with "excision", which is merely the resection of sufficient bone at the site of the former joint to induce pseudoarthrosis, with little regard for stability. The best age for arthroplasty is between 18 and 30, when rehabilitation through vocational training is possible if a change of occupation is necessary. In children the operation is not warranted, as it may produce epiphyseal injury and co-operation in after-treatment is seldom given. Local contraindications are tuberculosis; old, dense, eburnated bone, from osteomyelitis; active acute

infection; osteoporosis or atrophy, and arthritis deformans. In operating, the fusion is severed about  $\frac{1}{4}$  inch above the acetabulum, in a curve conforming to the head of the femur. The latter is remodeled to  $\frac{3}{5}$  or  $\frac{1}{2}$  of the normal size and made smooth with a shoemaker's rasp. Superficial bone for about  $\frac{1}{4}$  inch is excised from the acetabulum, which is then repolished with a Murphy reamer. Some material should always be interposed between the raw bony surfaces, preferably a free transplant of fascia lata, measuring 6 to 8 by 3 to 4 inches, from the lateral aspect of the thigh just above the knee. One end is stitched to the soft tissues about the acetabular margins, and is cupped so as to invest the surface. The other end invests the head and is held by a purse-string suture. It is also stitched to the adjacent soft parts or through drill-holes in the neck. This makes one continuous membrane investing the entire joint and forming a double layer between the raw articular surfaces. The pedunculated flap of Murphy has been abandoned except when a free transplant is not feasible.

Contrary to a general impression, the hip-joint is less favorable for arthroplasty than the knee. Among 16 properly traceable arthroplasties for ankylosis in one hip-joint, results were excellent in 9, fair in 2, and doubtful in 1; in 3 ankylosis recurred, and in 1 death occurred due to the operation and 1 year later. In bilateral ankylosis, the prognosis is more doubtful, for various reasons. Among 25 arthroplasties performed in 13 patients for ankylosis, 2 deaths occurred from relighting of a virulent infection. Altogether, infection was relighted in 7. In only 5 of the 25

arthroplasties could the results be classified as good, and in 1 as fair. In no case was a practical range of motion secured in both hips. Yet 5 patients were afforded great relief by receiving a satisfactory range of motion in 1 hip and correction of malposition in the other.

**KNEE.**—In fibrous ankylosis of the knee, S. D. Calonge (Jour. Amer. Med. Assoc., Oct. 22, 1927) uses an elastic device which can be adapted to increase either flexion or extension of the joint. Over a web belt 3 inches wide around the waist is passed a sliding sleeve of stiff leather to which is attached an adjustable elastic band  $1\frac{1}{2}$  inches wide. The latter, in turn, is attached below to the shoe top by means of a snap and ring. A guide band 2 inches below the knee holds the elastic band when it is slipped posteriorly to promote flexion, while when it is used anteriorly to promote extension the elastic passes through a guide on a leather knee-cap. At every step the tension is applied to the affected joint. The device can be worn under the trousers or while sleeping if a leather ankle cuff is used while the patient is in bed. Tension should not be such as to cause discomfort.

In fibrous ankylosis of the elbow, the writer uses an analogous device consisting of a figure-of-8 shoulder strap and an elastic band  $1\frac{1}{2}$  inches wide passing from a point over the distal end of the clavicle to a stiff leather wrist cuff, to which it is attached by a snap and ring. Tension can be regulated daily to keep up a constant pull on the forearm without causing pain in the joint. The arm can be extended at will by the patient. The appliance can be worn under the coat without attracting at-

tention, and should be worn during work or sleep. Where disability is due to limited elbow extension, a wrist cuff alone, with a 2½-pound shot-filled leather pad attached, will usually correct the limitation by gravity.

**ANOREXIA.** — **Hygienic measures** play an important part, as stated by G. Lyon (Bull. méd., Jan. 5, 1927), in all anorexias not dependent upon gastric disease or a general disorder. Overwork, toxic influences, and sedentary life must be avoided; likewise depressing emotions. **Physical culture** is valuable in poorly nourished, ptotic subjects. **Cold baths** are useful when well borne; otherwise the **Scotch douche** should be substituted. **Out-of-door life** and a sojourn in the mountains are indicated in nervous, overworked individuals and anemics. **Thyroid**,  $\frac{1}{3}$  to  $\frac{3}{4}$  grain (0.02 to 0.05 Gm.) a day, acts well in some patients, especially of the pale and apathetic type, with lowered basal metabolism. **Insulin**, 10 to 15 units, acts similarly in the poorly nourished and emaciated. In obese subjects with slowed metabolism, **subcutaneous injections of oxygen** in 200-c.c. amounts have seemed appreciably stimulating. **Cleansing of the tongue** of any thick coating with which it may be covered, thus laying bare the taste-buds, is a measure not to be ignored. As for the bitters, in persons whose occupations make it troublesome to use liquid medicines, the following may be prescribed: **Amorphous quassin**,  $\frac{1}{2}$  grain (0.03 Gm.); **sodium bicarbonate**,  $7\frac{1}{2}$  grains (0.5 Gm.); powdered **condurango**, 12 grains (0.75 Gm.), in a cachet; 1 cachet before each meal. Penzoldt's orexin is no longer

used. **Sodium vanadate**, a strong stimulant of metabolism, may be given in doses of  $\frac{1}{65}$  to  $\frac{1}{13}$  grain (0.001 to 0.005 Gm.) in granules in anorexic anemic or tuberculous patients. **Alkalies** in small doses before meals stimulate the appetite. The writer has also frequently seen good effects from the following solution, formulated by Hayem: **Sodium chloride**, 75 grains (5 Gm.); **sodium phosphate**, 45 grains (3 Gm.); distilled water, 1 quart (liter); one tumblerful to be taken cold 1 hour before breakfast. Anorexia in *enteroptosis* is readily combated with **exercises** and a **supporting belt**. In *cecal stasis*, **castor oil** in small doses on alternate days and **intestinal lavage** by the syphon procedure are the chief therapeutic measures. Anorexia in *cholecystitis* is met by a suitable **diet**; **mineral waters**, taken hot on an empty stomach, and **magnesium sulphate** in doses of 60 to 75 grains (4 to 5 Gm.) which stimulate the duodenal secretion and promote the excretion of bile. In *nervous anorexia* drugs are unnecessary and the cardinal measures comprise progressive increase of **diet**, **psychotherapy** to pave the way for such increase, **physical agencies** and **rest in bed**. In all instances a cause of the anorexia should be sought and, if found, suitably dealt with.

Among 1471 children between the ages of 1 and 14 years who came to the outpatient department of the Massachusetts General Hospital, according to W. M. Bartlett (Amer. Jour. of Dis. of Childr., Jan., 1928), no less than 349, or 24 per cent., had loss of appetite as the primary presenting symptom. In 121 of these patients no causative lesion could be found, and they were accordingly

grouped as cases of functional anorexia. In the remainder, possible causes of the anorexia were found as follows: Septic tonsils and adenoids, 77; acute infectious diseases, 29; tuberculosis, 24; pyelitis, 23; dental caries, 15; heart disease, 13; constipation, 11; chorea, 9; rickets, 7; bronchitis, 6; catarrhal jaundice, 6; intestinal parasites, 3; scurvy, 2; lung abscess, 1; splenic anemia, 1, and bronchial asthma, 1. Seven children with functional anorexia were treated with **saccharated iron**, 5 grains (0.3 Gm.) 3 times daily for several months; 9 others received **codliver oil**,  $\frac{1}{2}$  ounce (15 c.c.) 2 or 3 times daily; 24 others received a **diet** containing **liver, beefsteak** and **kidneys** at least 3 times a week. While the iron and codliver oil series were too small for reliable conclusions, it was of interest that the children given iron showed a mean gain in weight of 3.50 lbs.; those given the oil, of 4.75 lbs., and those given the liver diet, 7.90 lbs. The writer reminds us of the early effect of a liver diet on the appetite in pernicious anemia. In the absence of organic disease, anorexia of long standing is frequently associated with a mild secondary anemia. Improvement of the appetite and general condition following introduction of a liver diet is striking in these cases. Apparently liver contains some specific substance stimulating the appetite. At any rate, the most efficient and reliable measure for chronic functional anorexia is the introduction of fresh calf's liver, broiled beefsteak and lamb's kidneys into the child's diet.

**ANTHRAX.**—A case of anthrax in a young butcher, seen by Molinelli (Semana méd., June 3, 1926), was

peculiar in that 4 typical anthrax carbuncles developed; they all healed under treatment by **peptone**. Ginepro (Rev. Soc. Arg. de ped., Nov., 1925) reports the case of an infant whose mother had died 6 days before of anthrax and in whose heart blood the anthrax bacillus was found a week after birth. No especial symptoms in the infant had appeared.

**PROPHYLAXIS.**—Discussing in detail the prophylaxis of anthrax in the wool industry, F. W. Eurich (Lancet, Jan. 9, 1926) states that the most characteristic form of anthrax bacillus colony is obtained by cultivating the germ within agar, not on its surface. Upon adding a wash from a sample of hair to some melted agar (about 9 c.c. to a 4-inch plate), the resulting colonies will remain small and fairly distinct. The colony looks like gleet filaments when seen with the naked eye or a pocket-lens, and like a tangle of knotted strands with higher magnification. Wool and mohair washed beautifully clean, and of silky luster, may yet retain anthrax infection. This accounts for anthrax among those who manipulate wool in processes subsequent to washing. The source of the difficulty is the blood of the animal, which adheres strongly to the fleece, and with it the anthrax spores. Exclusion of all blood-stained material is inadequate protection, as the wool may have been washed in the country of export, yet dried serum and anthrax infection remain. As to the frequency of infection, the writer has found East Indian goat-hair most dangerous, with about 30 per cent. of positive results, closely followed by East Indian cashmere and Egyptian wool; then follow Persian wool, East Indian wool, and



mohair. In addition, Syrian wool, Tunisian and Mediterranean wool, and Chinese wool, goat-hair and alpaca must be considered dangerous.

Of all disinfectants tried, only **formaldehyde** answers all requirements. A 2 per cent. solution will, at 100° F., kill naked anthrax spores in 30 to 35 minutes. To insure proper penetration of formaldehyde through wool, the following procedures are required: (1) To soften clots, the opened wool is passed through warm water containing alkali and then through a further bath containing soap. (2) To drive out air bubbles and break up the softened clots, the wool is squeezed between rollers in its passage from one bath to the next, and this process is repeated as it passes into the formaldehyde bath (enclosed in a chamber). (3) The wool, emerging from the formaldehyde, again passes between rollers and travels on a moving lattice to a drying chamber, where it is dried. When the dried wool has been further stored for 2, or at most 3 days, the formalin will have completed its work, even the most resistive spores being killed.

Specific prevention of human infection seems indicated for persons engaged in specially dangerous occupations, as noted by A. Pijper (*ibid.*), but apart from **injections** of the specific **serum** in cases where infection has probably already occurred, no attempts in this direction seem to have been made.

The production of anthrax antiserum by simultaneous injections of edema fluid and anthrax virus is reported by C. Hruska (Ann. de l'Inst. Pasteur, Jan., 1927). In horses hyperimmunized against anthrax, injection of anthrax virus was carried out in 1 shoulder and in the other shoulder,

injection of edema fluid formed in cows at the point of inoculation with anthrax vaccine. The horse serum thus obtained was found to have great therapeutic potency. Its use in 3 stables in which anthrax had broken out cured the sick animals, and no new cases developed.

**TREATMENT.**—E. Bodin (Presse méd., Aug. 3, 1927) advises that all workers handling skins of foreign origin disinfect their hands after work and apply **iodine** at once to any abrasions. In developed anthrax, 40 c.c. of **serum** should be injected morning and evening subcutaneously in the flank or thigh until the local disorder is arrested. Locally, dressings of 1:100 **mercuric chloride** in normal salt solution should be used. When the infection has been mastered, an ointment of **balsam of Peru** and **iodoform** (100:1), or a powder, *e.g.*, **thymol iodide**, should be substituted for the wet dressings.

Four cases of anthrax peculiar in being traceable to 2 infected elephants which had recently died at the London Zoo have been reported by R. H. Boggon (Lancet, Feb. 26, 1927). Diagnosis was in each case made early by smears. The incubation period uniformly lay between 6 and 7 days, showing the necessity of watching contacts for a period exceeding a week. The early lesions were distinguishable from a septic spot only by the history, dark center, and white area immediately surrounding. All the cases responded well to **Sclavo's serum**, of which 60 to 110 c.c. was used. All the sores, however, took a long time to heal completely.

According to A. Pijper (Lancet, Jan. 9, 1926), treatment with **neorsphenamin** has not received the at-

tention it deserves. In South Africa, where anthrax serum was not readily available, over 40 consecutive cases were treated exclusively with the arsenical drug, without a single death, although some of the cases were very severe and 1 or 2 had seemed moribund. At the Pretoria Hospital, smears are made and examined at once on admission, a diagnosis being thus made with a probability approaching certainty in a few minutes. An intravenous injection of 0.6 to 0.9 Gm. of the drug is then given; the worse the apparent condition, the larger the dose. The patient is put to bed, a dressing of weak formaldehyde solution applied, and the part immobilized. Next day another injection is given. A rise of temperature commonly follows the injections. Exceptionally, a 3d injection on the 4th day of treatment is required. As a rule the symptoms, especially the edema, show definite improvement on the 3d and sometimes the 2d day. The temperature returns to normal in 5 or 6 days, the necrotic part drops off, and generally only a surprisingly small scar remains.

**ANTIMONY.**—J. B. Christopherson and S. R. Gloyne (Lancet, Jan. 30, 1926) point out that an alarming biochemical action, *viz.*, shock, may follow intravenous administration of antimony tartrate (potassium or sodium). An adult injected 3 times weekly may, after a dose of  $1\frac{1}{2}$  grains (0.1 Gm.) become clammy with perspiration and pale, with dilated pupils, sighing shallow respirations, general weakness, and painful extremities. Once thus upset, the patient tends to remain hypersensitive to the drug. It is suggested that this may be due to altered protein metabolism; in extreme cases it may resemble true protein shock. Other effects are rheumatic joint pains, coming on some hours after an injection and lasting 6 or 8 hours; paresis of

muscles; a flush around the site of injection; exaggeration of any rash previously present, *e.g.*, psoriasis; a "goose-skin" condition; leukoderma, and, with larger doses, hepatic fulness and pain, and even jaundice. A single dose of 13 grains (0.84 Gm.) given in error proved fatal in 12 hours in a case of bilharziasis. In therapeutic tests in several cases of psoriasis, complete disappearance of the disorder was obtained after some months of treatment. In rabbits succumbing to intravenous injections of antimony tartrate, there were found dilatation of the blood capillaries, pericardial and peritoneal effusions, hemorrhages into the lungs and spleen, retention of urine, and degeneration of the liver cells and, less constantly and markedly, of the kidney tubules.

The action of a number of *organic antimony derivatives* was tested by Chopra (Indian Med. Gaz., Apr., 1926) in cats. All were found more or less depressant to the heart, circulation and respiration. The systemic blood-pressure fell, while the pulmonary blood-pressure rose. The volume of the intestine, kidney and limbs decreased, while that of the spleen showed a marked increase.

**THERAPEUTICS.**—The best method of administering antimony tartrates to infants in whom intravenous therapy is found impracticable has been investigated by H. J. Smyly (Ann. of Trop. Med. and Parasit., July 22, 1927). Rectal administration proved inefficient and intramuscular injection painful. Intraperitoneal injection in very dilute solution with physiologic salt solution proved but slightly irritating in rabbits, and was successfully used in the cure of a case of *kala-azar* in an infant aged 6 months. The strictest aseptic technic is required in this treatment. Injections are made in the midline below the umbilicus and always at the same spot, because the parietal peritoneum is here firmly attached and in order to give no time for adhesion between the gut and the abdominal wall. The drug is given in a 0.02 per cent. solution in saline—12 mgm. of sodium antimonyl tartrate at a dose in 60 c.c. of saline in the case described. The site of injection is anesthetized with 2 per cent. procaine solution. During injection pressure is applied to the piston to produce a jet of fluid which will propel the adjacent bowel away

from the needle. The child treated received a total of 0.264 Gm. (4 grains) of the drug in triweekly injections in the course of 2 months. Intravenously, the writer finds 0.002 Gm. ( $\frac{1}{32}$  grain) per kilo. ( $2\frac{1}{2}$  lbs.) to be the average dose tolerated in man, given as a freshly prepared 2 per cent. solution in distilled water. He has not found any commercial antimony tartrate to be chemically pure on quantitative analysis, and prepares his own C. P. salts by a method described by Christianson and Norton in 1923.

Experiments *in vitro* by Christopherson (Brit. Med. Jour., Mar. 5, 1927) showed a direct toxic effect of antimony on live bilharzia ova, although it had no apparent effect on dead ova. The action on the ova as well as the adult parasite makes antimony the most valuable agent in bilharziasis, and probably one of the most complete remedies in the therapeutic arsenal.

Cases of phagedenic genital ulcerations refractory to local measures were rapidly healed by intravenous use of antimony and potassium tartrate, according to J. Kingsbury and S. M. Peck (Jour. Amer. Med. Assoc., Dec. 4, 1926). A 1 per cent. solution was used. The sterility of the solution is secured by its germicidal power; it should never be boiled. The dosage begins with 3 c.c. (48 minims), to be increased by 1 c.c. (16 minims) at each injection until 10 c.c. (160 minims) is reached. Three or 4 injections a week may be given. They should be given slowly, to reduce the chances of a reaction. In phagedenic ulcerations the treatment should be continued until almost complete epithelization has taken place, but in granuloma inguinale, for several weeks longer, to prevent recurrence. Few patients showed reactions.

**AORTITIS.—ETIOLOGY.**—Inflammatory foci appear to a varying degree in the aortic wall in different infectious diseases, as stated by M. H. Brown (Ann. of Clin. Med., Oct., 1926), who studied 29 such cases, with aortitis complicating, *e.g.*, the pneumonias, endocarditis or recurrent heart disease, rheumatic fever, typhoid fever, periostitis with pyemia, acute

tuberculous meningitis, measles, puerperal endometritis, acute otitis media, etc. The most marked aortic reactions were associated with rheumatic fever, which caused a mesarteritis differing from early syphilitic aortitis only in a less marked lymphoid infiltration about the vasa vasorum and certain other special features. Aortic reactions in typhoid were also quite striking. In general, in infections, the characteristic aortic lesion is a non-suppurative inflammatory reaction about the vasa vasorum of the outer  $\frac{1}{2}$  of the media, with necrosis of the neighboring muscle cells and elastic fibers. There is almost no polymorphonuclear response. The reactions were nearly always most intense in the arch of the aorta. The common mode of localization of acute infections is apparently by way of the adventitia through the vasa vasorum and thence to the media. Evidently, acute infections play an important part in the genesis of arteriosclerosis.

**PATHOLOGY.**—In 33 cases of syphilitic aortitis, W. W. Waite (Amer. Jour. Med. Sci., Mar., 1927) found that syphilis may attack this vessel either locally or generally—more usually the latter. The ascending aorta usually suffers most, but throughout the process consists of a strangulation necrosis caused by periarteritis and obliterating endarteritis of the vasa vasorum, which starves and destroys the elastic layer. When the condition is violent, it travels as a serpiginous ulcer, causing aneurisms and a vegetative growth on the intima, which may break off and form emboli. The ulcers, wherever found, are due to a sudden cutting-off of the local blood-supply.

Changes in the aortic valve that may

accompany syphilitic aortitis are discussed by O. Saphir and R. W. Scott (Amer. Jour. of Path., Sept., 1927). Grossly, there are adhesions between the lateral parts of the leaflets and the aortic intima, leading to a separation of the commissures. Hyaline plaques in this area are secondary. Histologically, the parts show first degenerative and later chronic inflammatory changes.

No less than 126 cases of syphilitic aortitis were found by B. J. Clawson and E. T. Bell (Arch. of Path. and Lab. Med., Dec., 1927) among 4577 necropsies in persons over 20 years of age who died from other causes. Classified as to the clinical courses and the conditions found at autopsy, these 126 cases showed: (1) Aortic insufficiency, 46 cases, or 36.5 per cent.; (2) sudden death from closure of coronary orifices, 25 cases, or 19.9 per cent.; (3) rupture of aortic aneurism, 35 cases, or 27.7 per cent.; (4) gummas of the myocardium, 3, or 2.4 per cent.; (5) miscellaneous (death from other causes), 17, or 13.5 per cent. According to E. Heller (Deut. med. Woch., July 15, 1927), the chances of the occurrence of meso-aortitis in syphilitic persons amount to 1:9 to 1:7. While about  $\frac{1}{2}$  of these subjects succumb to this condition, only 1.9 per cent. die under the age of 50 years.

**DIAGNOSIS.**—Many cases of aortitis remain undiagnosed until they have reached a late stage. According to B. H. Nichols (Radiol., Aug., 1927), early symptoms that should lead one to suspect its presence are: (1) Shortness of breath on exertion and a feeling of oppression in the chest; (2) sighing respiration; (3) oppression in a close room; (4)

pain of anginal character, and (5) orthopneic dyspnea. The X-ray is the most reliable method of early diagnosis of aortitis or aneurism, or for determination of the extent of the disease. In aortitis the aortic shadow shows increased density on account of the diseased condition of the aortic walls. In some cases an injection of iodized oil is of assistance in showing the exact position of the walls of the trachea.

The diagnosis of *abdominal aortitis*, according to H. Vaquez and E. Donzelot (Paris méd., July 2, 1927), is far less easy and clear-cut than some have maintained. Even rupture of the abdominal aorta following ulceration may cause either intense pain, slight pain, or no pain at all. Thrombosis of the aorta causes no definite local pain, but pain and gangrene in the lower extremities, or sometimes a complete paraplegia. As for simple abdominal aortitis, the pain of acute aortitis can be reproduced by any one of a number of acute abdominal states, and can serve only to call attention to the possibility of aortitis being the cause of the pain. Tenderness over the abdominal aorta can be produced by any visceral condition irritating the solar plexus. Widening of the abdominal aorta is far more difficult to make out, even with the X-ray, than that of the thoracic aorta. Movability of the abdominal aorta actually occurs mostly in the absence of disease of the vessel in thin, dyspeptic, viscerotonic subjects. Only when present in combination do pain, widening and movability of the aorta afford even a suspicion of abdominal aortitis; definite changes in the vessels elsewhere, especially the thoracic aorta,



lend some further support to this suspicion.

Changes in the abdominal aorta, other than the presence of aneurism, are practically never such as to give rise to a murmur.

With regard to the indirect signs of abdominal aortitis, Teissier's view that a blood-pressure in the dorsalis pedis artery exceeding that in the radial points to this disorder is incorrect, since with modern instruments the former pressure is normally always found to exceed the latter. Of greater interest is Mougeot's assertion that where the femoral pulse-wave precedes the radial pulse-wave, abnormal sclerotic rigidity of the abdominal aorta is probable; as a matter of fact, however, in cases of abdominal aortitis confirmed by autopsy this discrepancy has not been found to have occurred.

X-ray visibility of the abdominal aorta is obtainable only by 1 of 2 artifices, *viz.*, combined inflation of the colon and stomach, or pneumoperitoneum. Even these procedures are seldom definitely successful, and it is plain that new methods of clinical study will be required to permit of a reliable diagnosis of abdominal aortitis.

In *dilatation of the aorta*, Fabj (Policlin., June 7, 1926) describes a semilunar area of dulness in the paravertebral line at the level of the 3d rib, the diagnostic utility of which was confirmed by X-ray examinations. In dilatation of the ascending aorta, Loktionowa (Deut. Arch. f. klin. Med., Dec., 1926) endorses Glinchikoff's diagnostic procedure on the basis of experience with it in 51 cases. When the patient raises his arms, a pulse smaller on the right side than on the left is held to indicate dilatation of this portion of the aorta.

### APPENDICITIS.—SYMPTOMS.

—A review of teachings in medical schools and current text-books revealed to J. O. Bower and J. H. Clark (Jour. Amer. Med. Assoc., Sept. 10, 1927) that the signs and symptoms of appendicitis are still taught essentially as enunciated by Murphy in 1890, when most cases coming to operation were appendiceal abscesses or ruptured appendices with general peritonitis. Symptoms encountered mainly in peritonitis are still taught as occurring in appendicitis. Pain, localized tenderness, increased tension or rigidity, and leukocytosis are sufficient to make a diagnosis of appendicitis. The following percentages relating to the various symptoms and signs were found by the writers in 218 consecutive cases:

	No Peritonitis	Local Peritonitis	General Peritonitis
Pain .....	100.0	100.0	100.0
Nausea .....	35.2	44.8	42.3
Vomiting ....	50.0	60.2	80.9
Local tenderness .....	89.3	89.8	89.7
Increased tension .....	43.3	39.8	26.9
Rigidity .....	40.6	44.9	65.5
Increased temperature ...	68.9	76.9	84.4
Increased pulse	44.1	63.0	84.4
Leukocytosis .	79.7	84.8	95.0

Increased tension and rigidity showed the relationship theoretically to be expected as the inflammation extended from the appendix to the peritoneum. The commonly taught symptoms, nausea, vomiting and increased pulse-rate, occurred in the majority of instances only when the complication of local or general peritonitis developed. As for leukocytosis, the total number of leukocytes seemed of greater value than the percentage of polymorphonuclears. There is apparently an upper level of leukocytosis in acute appendicitis, even with asso-

ciated general peritonitis. Only 1 per cent. of the cases were over 30,000; 6 per cent., over 25,000, and 13.3 per cent., over 20,000. Of those above 25,000, 90 per cent. had a general peritonitis.

According to G. Robertson (Surg., Gyn. and Obst., Dec., 1926), *pain* in acute appendicitis is of 2 distinct varieties: (1) Localized pain due to localized peritonitis of the parietal peritoneum, *i.e.*, involvement of the sensory nerves in the subendothelial layer in this area. This pain is accompanied by localized tenderness of the abdominal wall and by rigidity of the overlying parietal muscle. It is never a referred pain. (2) Pain due to visceral muscle spasm. This is unaccompanied by definite tenderness or rigidity, is often localized over the appendix area, but is also very often "referred" to the regions of the epigastrium and umbilicus. In the *referred pain* of acute appendicitis the afferent sympathetic impulse is visceral (appendicular wall), the response efferent sympathetic to viscera (pyloric and ileocecal sphincteric spasmotic contraction), the latter causing vigorous peristalsis of the ileum; these, referred to corresponding spinal segments, are interpreted as epigastric pain, right iliac pain (McBurney's point) and umbilical pain.

The diagnostic significance of a brief, sharp epigastric pain as the first symptom in acute appendicitis is endorsed by Pavlovsky (Arch. Argent. de enf. del ap. dig., i, 649, 1926). This pain may or may not be accompanied by vomiting, and by the time the iliac fossa symptoms develop may have slipped the patient's memory. The upper epigastric area exhibits tenderness, the skin is sensitive, and there is rigidity of the left rectus, all of these

before the symptoms have appeared on the right side.

Among 2841 acute cases, R. Colp (Ann. of Surg., Feb., 1927) found an incidence of *chills* of from 6.6 to 6.9 per cent. in all of various groups of the cases—acute catarrhal or gangrenous appendicitis, or appendicitis with abscess or with peritonitis. A history of chills should be inquired for in all cases of acute appendicitis. While a chill in the 1st 48 hours is not an index of the severity of the disease or the extent of pathologic changes, primary chill on the 3d day or later seems associated with abscess formation or the onset of general peritonitis. When a chill is present, especially in gangrenous appendicitis, the possibility of *pylephlebitis* should constantly be borne in mind, and the appendicular mesentery should be carefully investigated for evidence of suppurative phlebitis. When chills are multiple, a routine *ligation or resection of the ileocolic vein* should be done, preferably before the actual *appendectomy*. Postoperative chills are invariably due to suppurative *pylephlebitis*.

G. M. Tanner (Lancet, May 7, 1927) presents an analysis of 50 cases supporting the belief that *castor oil* causes acute appendicitis to assume a more violent course. In each of the 8 cases in which castor oil had been taken, the appendix was gangrenous and in 2 it was perforated. In 6 of them pus was also present, and 1 patient died. It is significant that while only  $\frac{1}{6}$  of the 50 cases had had castor oil, this  $\frac{1}{6}$  included  $\frac{1}{2}$  of those who developed an appendix abscess. Bower and Clark (*loc. cit.*) find that the public is not yet aware of the dangers of using laxatives when there is abdominal pain.

In regard to *left-sided appendicitis*, R. Bloch (Presse méd., Mar. 23, 1927)

points out that there may occur 2 distinct forms: (1) Clinically left-sided appendicitis, in which the pain is on the left side, though the cecum is situated normally, and (2) anatomically left-sided appendicitis, in which the pain is on the right side, though the cecum is situated in the left iliac fossa. The former type occurs when the appendix is long and disposed transversely; the inflammation is limited to the end of the organ. The anatomic type comprises the cases of partial or complete inversion, but  $\frac{1}{2}$  of the published cases have had the pain on the right side. The diagnosis of a left-sided appendicitis can be made with the X-rays, but generally it is established only at operation. When the appendix is presumed to be situated outside of the right iliac fossa, a median incision in **appendectomy** is advisable.

**DIAGNOSIS.**—Acute and recurrent *pseudoappendicitis* due to intercostal neuralgia is emphasized by J. B. Carnett (Amer. Jour. Med. Sci., Dec., 1927). The many cases which the clinician diagnoses as "acute" appendicitis and the pathologist, examining the specimen removed at operation, as "chronic" Carnett regards as acute pseudoappendicitis. The commonest underlying cause of the latter is an infection of the upper respiratory tract giving rise to a toxic intercostal neuralgia. Acute pseudoappendicitis is most frequent below the age of 30 years and affects more females than males. The asthenic viscerotonic types are especially susceptible. The abdominal symptoms may arise at any stage of the respiratory infection, but are commonly delayed until the 2d or 3d day after the patient believes he has fully re-

covered. By the ordinary tests many cases suggest true acute or subacute appendicitis, with nausea, pain and tenderness in the right iliac fossa, hurried pulse, moderate fever and leukocytosis. But the pain and tenderness are often so widespread that they could be accounted for only by a diffuse complicating peritonitis, yet true rigidity is absent and the pulse rate and leukocyte count are not very high. Various other discrepancies may be noted in individual cases. True rigidity definitely points away from pseudoappendicitis.

The most important differential test, however, is the 2-stage test of palpation over the abdominal muscles, 1st, while relaxed, and 2d, while voluntarily held as tense as possible. Tenderness present both when the muscles are relaxed and when they are tense is parietal in origin and points to pseudoappendicitis. Tenderness present with relaxed muscles and absent on vigorous finger-end poking with tense muscles is obviously located deeper than the parietes, but its location at or near McBurney's point does not necessarily imply that its source is a tender appendix. Tenderness of lumbar vertebræ and of the right sacroiliac joint, often mistaken for deep appendiceal tenderness, can be safely eliminated by exact comparative palpation on the left side. Localized tenderness which is subparietal at or near McBurney's point, and not due to tender spine or joint, is most likely due to appendicitis. Yet McBurney's point has no magical association with appendicitis. The major local symptoms of appendicitis are manifested at whatever site the appendix is located and furthermore, at the site of the par-

ticular portion of the appendix that is diseased. Surgeons know that the base of the appendix is commonly not located at that point [see annexed cut].

Supposed simulations by acute or chronic appendicitis of acute or chronic gastric, duodenal or biliary affections are most frequently due to unrecognized intercostal neuralgia of the upper anterior abdominal wall.

Skin tenderness is a symptom of pseudoappendicitis, and its occasional association with true appendicitis is nearly always accidental. When parietal palpation tenderness is present in the lower abdomen—as it is in pseudoappendicitis—it will also be found in a band-like area overlying and paralleling Poupart's ligament and in a V-shaped area in the upper buttock. A leukocytosis of only 14,000 or less points to pseudo- rather than true appendicitis. Vomiting may occur in pseudoappendicitis. The peritoneal tenderness—excluded by voluntary tension of the muscles during palpation—seldom exceeds  $\frac{1}{2}$  the total parietal tenderness in acute pseudoappendicitis. Rigidity may be met with in very exceptional cases of acute pseudoappendicitis—those of parietal neuralgia of the abdomen caused by basilar pneumonia or pleurisy. Otherwise, rigidity, even when parietal symptoms are clearly demonstrable, points directly to inflammation of the appendix or some other viscus. High fever, leukocytosis over 30,000 and rapid respirations contraindicate true appendicitis, irrespective of parietal pain, tenderness and rigidity, and demand careful investigation above the diaphragm.

There is a considerable group of individuals, especially among the vis-

ceroptotics, in whom the intercostal nerves are irritated to a point short of giving frank symptoms. They tend ultimately to develop chronic pseudoappendicitis, but before doing so show a predisposition to attacks of acute, subacute and recurrent pseudoappendicitis from relatively slight causes, such as mild infections, injections of vaccines, menstrual phenomena, active exercise, mild vertebral trauma, etc. Patients who have right-sided pain only in the late afternoon or evening, or following a customary day's work, and are relieved by lying down, belong to this group, as do other patients who have learned that wearing an ordinary corset overcomes their having similar pains. Before agreeing to remove the appendix, the writer always desires to see the patient during a recurrent attack to apply the tests for acute pseudoappendicitis already referred to. The more numerous the preceding attacks of abdominal symptoms, the more likely is the case to be one of pseudoappendicitis.

The difficulties of distinguishing *paratyphoid B infection* from appendicitis are practically eliminated, according to J. Enkling (Deut. med. Woch., Aug. 12, 1927), by the blood examination. In observations on 75 cases, the leukocyte count in paratyphoid never rose above 12,000. Also pointing to paratyphoid are a lymphocytosis with shift to the left and an extremely low ratio of young cells.

According to E. Sachs (Zent. f. Chir., Oct. 8, 1927), absence of tenderness of the broad ligament upon rectovaginal finger palpation points to appendix disease, whereas tenderness in this situation definitely indi-



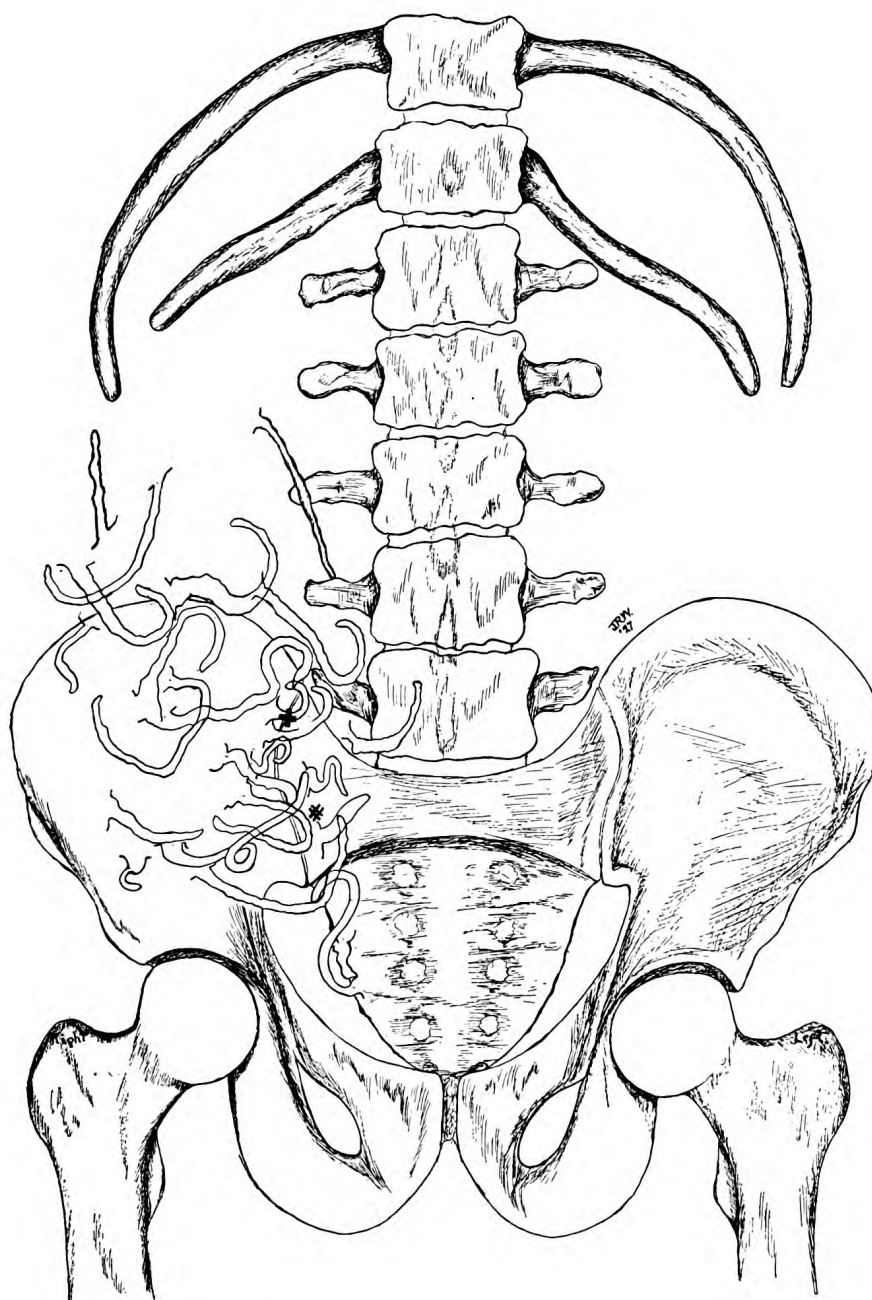


Diagram of positions of 24 appendices visualized by barium Roentgen-ray examination. Skiagrams taken in the supine posture with Roentgen-ray film on the abdomen. The single cross is at McBurney's point and the double cross at Lanz's point. (Carnett, in *Amer. Jour. Med. Sci.*)

cates a *gynecologic disorder*. Thickening of the broad ligament *per se* has no definite significance.

In a case reported by McCash (Brit. Med. Jour., Apr. 30, 1927), a sharp pain in the right iliac region had been felt when the patient reached up to get a jar from a shelf. There was slight resistance in the lower  $\frac{1}{2}$  of the right rectus muscle and slight deep tenderness, especially 1 inch above and within McBurney's point. A diagnosis



Appendiceal Abscess.—Case I. Plate 6 hours after barium meal. X indicates site of abscess. Arrows point to displaced and fixed terminal ileum. (Ritvo, in *Boston Med. and Surg. Jour.*)

of subacute appendicitis having been made a right paramedial incision was carried out. The *rectus* sheath was found blood-stained, and on opening it the middle  $\frac{1}{3}$  of the *muscle* proved to be ruptured  $1\frac{1}{2}$  inches below the umbilicus. The appendix was normal. Recovery followed suture of the muscle.

In 2 cases seen by K. W. Bender (Zent. f. Chir., May 8, 1926), appendicitis was simulated by *torsion of epiploic appendages*. One patient had had sudden pain in the right abdomen, without vomiting, constipation or rigidity. The pain was not at McBur-

ney's point, but 1 fingerbreadth above the crural arch. At operation the appendix was found normal, and a little above the ileocecal junction was an epiploic appendage with its pedicle very thin, twisted and gangrenous, removal of which, along with the appendix, resulted in recovery.

The *subhepatic type* of appendicitis may cause symptoms suggestive of hepatic, renal or gastroduodenal disease, as observed in 7 cases by H. Blanc (Paris chir., May-June, 1926). In 1 case, in which renal colic, cholecystitis and finally appendicitis were in turn suspected, a long, badly diseased appendix extending to the lower pole of the kidney was found at operation. No certain indication of subhepatic appendicitis is known, but where there is actually disease of the liver, gall-bladder, stomach or kidney, the true condition will generally become evident upon careful, detailed analysis of all the symptoms.

Low-grade, walled-off appendiceal abscesses may cause obscure symptoms and go undiagnosed for days or even weeks. In such cases M. Ritvo (Boston Med. and Surg. Jour., Aug. 25, 1927) has found *X-ray study* of assistance. In 2 cases described, barium meals were given and the routine X-ray studies of the gastro-intestinal tract made without apparent harm to the patient. In each instance, a displacement of the cecum and terminal ileum was found, varying with the location and size of the abscess. In 1 case a loop of ileum, the cecum and the ascending colon formed a circle about the size of an orange around the abscess. In the 2d case, the abscess was below the cecum and extended downward into the pelvis, the cecum and terminal ileum forming a roof over it. In both cases the cecum and terminal

ileum, normally movable structures, were found fixed in the positions mentioned. Also, definitely localized tenderness was present over the region of the abscess—not at McBurney's point—on fluoroscopic palpation.

The observed presence of *diarrhea* in 4.5 per cent. of 3285 cases of appendicitis warrants care, according to H. K. Tuttle (Boston Med. and Surg. Jour., June 2, 1927), in eliminating appendicitis on the strength of this symptom alone.

**COMPLICATIONS.**—*Phlebitis of the left femoral vein* was observed by G. Bolognesi (Lyon chir., May-June, 1926) in 4 out of 462 cases of appendicitis. In 2 it followed an acute attack without operation, and in the other 2, developed a few days after appendectomy. Three patients were women. Tuberculous infection seemed to be a predisposing factor, as all the patients had enlarged lymph-nodes or other evidence of tuberculosis. The fact that the left external iliac vein is longer and more oblique than on the right accounts for the more frequent phlebitis on the left side.

*Fecal fistula* occurred in 222 out of 4655 cases of acute appendicitis, or nearly 5 per cent., according to J. B. Deaver (Ann. of Surg., June, 1926). Of the 222 fistulas, 86 healed spontaneously, 108 required operative repair, and the remainder left the hospital refusing operation. In 55.5 per cent. of the cases, simple **inversion** of the fistulous opening by a **purse-string suture** followed by reinforcement by an additional suture line was the only procedure required. In 15 per cent., doubt of the regenerative power of the bowel existed, and an **ileocolostomy** was performed to short-circuit the affected bowel. In 23 per

cent. there were either multiple fistulas or a fistula so large as to preclude closure with maintenance of lumen. Some required **resection** of bowel varying from a small portion of the cecum to resection of a foot or more of the terminal ileum with the cecum and entire ascending colon.

A case of perforated acute appendicitis reported by A. Catterina (Polyclin., Nov. 15, 1927) seemed unique in being complicated by a hernia of the small bowel through a mesenteric opening, as well as by ileus and peritonitis. Recovery followed operation.

**PROGNOSIS.**—An impression has arisen, as instanced by Sivertsen and Dahlstrom (Minn. Med., Aug., 1927), that the mortality from appendicitis has increased during the last 15 years, familiarity with the condition having apparently "bred contempt." An investigation of Massachusetts vital statistics leads A. W. Marsh (Boston Med. and Surg. Jour., Dec. 2, 1926) to suggest that the reason for the apparent increase may be a more correct diagnosis. While the death-rate from appendicitis rose steadily, from 1905 to 1925, from 8.79 to 12.6 per 100,000, the deaths from peritonitis dropped from 14.85 to 7.57. If both diagnoses are considered together, assuming that the larger proportion of the peritonitis cases originated in appendicitis, Marsh finds (in Worcester statistics) a rate declining from 28.5 to 20 in the period 1890 to 1924.

Tuttle (*loc. cit.*) reports 1208 cases of acute catarrhal appendicitis, with a mortality rate of 0.2 per cent.; 520 cases of suppurative or gangrenous, non-perforative appendicitis, 0.4 per cent.; 268 cases perforative, with local peritonitis, 6.7 per cent., and 100



cases perforative, with diffuse peritonitis, 24 per cent. Among a total of 56 deaths, diffuse peritonitis was the cause in 36, and septicopyemia in 8. There were 2 deaths from remote complications of appendicitis, *viz.*, chronic nephritis and acidosis, and the remaining 10 deaths were from various conditions not connected with the appendicitis.

In 247 cases of appendicitis so far advanced as to require drainage, as reported by A. P. C. Ashhurst (Ann. of Surg., Jan., 1927), there were 98 of primary abscess, 44 of gangrene, and 68 of diffuse peritonitis. The mortality in these groups was 8.1, 4.5 and 16.1 per cent., respectively. All were operated on as soon as possible after admission to the hospital. Of 37 cases of diffuse peritonitis in which operation was delayed, 6 patients died without operation. In 20 cases in which the abscess was drained and the appendix not removed, the mortality was 35 per cent., while in 11 similar cases in which the appendix was removed, there was no mortality.

**TREATMENT.**—Justification for what some have termed “armed expectancy” in the treatment of acute appendicitis is greatly lessened, in the opinion of A. Chauvenet (Gaz. des hôp., Mar. 30, 1927), by the fact that the actual advent of complicating factors such as perforation and diffuse peritonitis precedes by a considerable interval the appearance of the clinical signs pointing to them. There are cases of appendicitis in which study of the pulse, temperature, facies and changes in the condition of the abdomen does not permit of foretelling the serious complications that will later suddenly make their appearance; in some instances, operating early, the

writer has intervened *after* the actual occurrence of serious pathologic changes, such as gangrene, but *before* the clinical evidences of these conditions had developed. As in intestinal obstruction, watchful waiting for the least sign of increasing trouble gives poor results, for when that evidence of aggravation appears, it is already too late to serve the best interests of the patient in operating. Clinical aggravation takes place in abrupt changes, without appreciable transitional states. Operation in the earlier hours of an attack of appendicitis is attended with no greater risk, according to the writer's experience, than is an interval operation. Such being the case, the dire results from delayed operation following a period of watchful waiting are thus avoidable.

Describing the management and results of 3285 cases operated for appendicitis, Tuttle (*loc. cit.*) notes that the McBurney incision was used in 2629; the McBurney with stabs for drainage in 118; the McBurney enlarged toward the right flank in 19; the midline suprapubic incision in 438; the low right rectus incision in 107; right inguinal herniorrhaphy in 62; ventral hernia repair in 13, and an upper abdominal incision in 26. **Drainage** was employed in 493 cases. Gauze drains, in the writer's belief, have no place in abdominal surgery except to check hemorrhage. Of the appendices removed, 7.1 per cent. were found normal by the pathologist, and 28.7 per cent. were chronically diseased. The associated conditions most commonly found at operation comprised: Female pelvic conditions, 287 cases; Lane's kink and Jackson's membrane, 256; right inguinal her-



nia, 62; cholelithiasis and cholecystitis, 37; ventral hernia, 13; gastric and duodenal ulcers, 5; intestinal obstruction, 5; renal conditions, 5, and tuberculous peritonitis, 3.

In non-drainage cases with McBurney incision the patient was encouraged to get up in a wheel chair as soon as able, and many patients were walking by the 4th or 5th day. Hospital days in acute catarrhal cases averaged 15.5; in suppurative or gangrenous, non-perforative cases, 13.5; in perforative cases with local peritonitis, 31.2, and in perforative cases with diffuse peritonitis, 41.0. Drainage cases with peritonitis localized to the right side of the lower abdomen were **turned on the right side** or placed in the **Fowler position**. In diffuse peritonitis, the high Fowler position, liberal use of **morphine**, and **saline, glucose or sodium bicarbonate solutions**, given subcutaneously, intravenously or rectally, are especially indicated. Stimulation with drugs is frequently needed. Bladder catheterization after operation was practically eliminated by using **benzyl benzoate** and allowing the patient to stand beside his bed. In suppurative and gangrenous non-perforated cases, the usual causes of death are rupture of a pus appendix during removal or a beginning peritonitis overlooked and left undrained. When there is evidence of peritoneal involvement without perforation the writer merely leaves a small **rubber tissue drain** down to the appendix stump; it can be removed in 2 days and if the peritoneum has escaped infection the wound will heal by primary union without delay. In spreading peritonitis, many instances of both the Murphy and the Ochsner methods of

treatment were observed, with apparently little difference in the result. Cases of diffuse peritonitis should be given the chance of recovery which immediate operation frequently achieves in apparently hopeless cases. The operation may be only simple **drainage** under **local anesthesia**. Cases with the abdomen full of pus are much more likely to recover than those with the abdomen full of dry, red, swollen intestines. The abdomen is first opened through a McBurney incision, the appendix removed if this is possible with safety, a finger passed under the abdominal wall and a suprapubic stab wound made. If further drainage seems necessary, the finger is passed through the suprapubic wound and another stab wound made over the left iliac fossa. **Rubber tubes** are inserted to the pelvis and a high **Fowler position** instituted.

According to N. H. Copenhaver (Va. Med. Mthly., Sept., 1926), all late cases with evidence of beginning peritonitis are best treated medically, *viz.*, by absolute **rest in bed**, the **Fowler position**, an **ice-bag** to the abdomen, fluids only by **hypodermoclysis** and **proctoclysis**, and **opiates** in sufficient amount to keep the patient quiet and arrest peristalsis. Usually about the 5th or 6th day the temperature drops, whereupon operation should be performed at once. If, after a week of expectant treatment, the patient does not improve, an operation under **local anesthesia** for **drainage** alone, without any attempt to find or remove the appendix, is justifiable and may prove beneficial.

In a case of *mesenteric thrombophlebitis* complicating appendicitis 11 days after the removal of a perforated

gangrenous appendix, Melchior (Zent. f. Chir., Dec. 3, 1927) operated again with success. Through a midline incision the ileocolic vein was ligated below its junction with the superior mesenteric vein. The ileocolic vein is the vessel through which extension of infection takes place. Wilms had already operated similarly in a like case, with recovery, and in addition, the writer found in the literature 8 cases of ligation of the ileocolic vein during the primary operation for appendicitis. As the complication referred to is otherwise certain to be fatal, performance of this operation in such cases appears well warranted.

According to Portes and Seguy (Gyn. et obst., Feb., 1927) appendicitis runs the same course during pregnancy as otherwise, but delivery hastens the occurrence of diffuse peritonitis. Recurrence of appendicitis is favored by pregnancy. In appendicitis developing during pregnancy, operation should be carried out without unnecessary delay, while in young women subject to appendicitis, appendectomy should be done before marriage. From 10 to 15 per cent. of pregnancies are interrupted when appendicitis occurs, whether the treatment be expectant or operative. Labor does not contraindicate appendectomy.

**Serum therapy** is advocated in fulminating appendicitis by Hilgermann and Pohl (Münch. med. Woch., Oct. 7, 1927), who state that such cases are generally due to either pneumococci, streptococci or diphtheria bacilli. A definitely specific serum is required even in the case of the former 2 organisms, since one of a diversity of strains of these germs may be concerned. The primary focus of infection resides in the tonsils, and the infection of the appendix apparently

takes place by way of the blood stream.

**APPENDECTOMY.**—A split fascia incision is recommended by A. N. Claggett (Ill. Med. Jour., June, 1926), to avoid various difficulties encountered with the ordinary gridiron incision. From a point  $\frac{1}{2}$  inch above the junction of the middle and outer thirds of the line uniting the umbilicus and right anterior superior spine an incision is started which extends down parallel to the rectus muscle. It goes through down to the aponeurosis. The external oblique fascia is now divided so that the red fibers of the oblique show outside of the incision. The inner part of the split fascia is grasped with 3 forceps and separated with a knife-handle from the internal oblique  $\frac{3}{4}$  to 1 inch within the outer margin of the rectus muscle. The sheath of the rectus, here composed of the internal oblique fascia alone, is now incised. A cuff of at least  $\frac{1}{4}$  to  $\frac{1}{2}$  inch of fascia is left medial to the incision. With 3 forceps the outer edge of the internal oblique fascia is next grasped, and with a Kocher director the rectus fibers, with a few branches from the deep epigastric and usually a small nerve from the intercostals, are pushed toward the midline. Finally, the posterior sheath and peritoneum are incised. In closing the incision, the peritoneum and transversalis fascia are sutured, the rectus brought back to and secured in its original position in the sheath with a few sutures of catgut, and the internal and external oblique fasciæ sutured with fine kangaroo tendon or chromic gut. This incision is advantageous in that it gives the most direct access to the appendix; can be enlarged for a displaced appendix or for exploration; permits of draining an abscess by pushing the fascia away from the peritoneum outwardly and so approaching the abscess outside of the wall of adhesions, and in practically precluding the possibility of hernia.

In *perforative appendicitis with localized peritonitis*, Tuttle (*loc. cit.*) makes an incision close to the anterior superior spine and Poupart's ligament. If the appendix is readily visualized, it is removed. Excessive hemorrhage from separation of adhesions usually means too much "messing around,"

and it is far better to establish efficient drainage and remove the appendix at a later date. The McBurney incision is especially adapted for these cases with localized peritonitis. Often the cecum can be lifted up, the appendix removed, and drainage placed along the posterior and lateral parietal peritoneum without the small intestine being seen. Exposure of the small intestine is apt to start a diffuse peritonitis. Packing of the peritoneal cavity with gauze is to be condemned. Moist gauze leaves its imprint on the serosa, with resulting devitalization. The infection present will produce adhesions, with possible intestinal obstruction. It is better to work on the outer side of the infection and respect nature's barriers.

In regard to the *treatment of the appendix stump* in appendectomy, F. I. Harris (Cal. and West. Med., July, 1927) contends that the inversion methods are dangerous, unsurgical and unnecessary: (1) **There is** danger of abscess formation in the wall of the cecum, as illustrated in a recent fatal case with autopsy. (2) In the **true inversion** method there is danger of secondary hemorrhage from the unligated appendicular artery. (3) The inversion methods are not applicable to every case, require more time and offer greater technical difficulties. (4) They are largely responsible for post-operative adhesions and probably favor fecal fistula. (5) They lead to remote complications such as inflammatory tumors of the cecum and diverticula. The **non-inversion method** of dealing with the stump has several theoretical objections, yet has been used by all the surgeons of the Mt. Sinai Hospital, New York, for 25 years without a single cause for regret. In the non-inversion procedure endorsed by the writer, the appendix is not crushed with forceps, but merely with a No. 2 chromic gut ligature firmly tied about  $\frac{1}{4}$  inch from the base. A split gauze is next carefully draped around the base of the appendix, a straight **Kelly clamp** applied about  $\frac{1}{4}$  inch distal to the ligature, a bone sponge held in a forceps just behind the appendix by the assistant, and the appendix severed by a knife previously dipped in **phenol**. The funnel-shaped stump, held by the operator by means of the original tie, is now thoroughly cauterized by the tip of a straight

hemostat, previously dipped in a small basin of phenol just as a pen is dipped in ink. When the stump is whitened by the phenol—usually after 2 applications—it can be assumed to be practically sterile. The ends of the ligature are then cut about  $\frac{3}{4}$  inch long, and the stump dropped back into the abdominal cavity.

According to Sivertsen and Dahlstrom (Minn. Med., Aug., 1927), **ether** is of value in suppurative appendicitis by reason of its antiseptic, coagulating and stimulating properties. The use of the **Penrose cigarette drain** eliminates the occurrence of fecal fistulas.

**Appendicostomy** in the treatment of suppurative appendicitis is recommended by E. M. Miers (Jour. Kas. Med. Soc., Mar., 1927) on the basis of favorable experiences in 31 cases. After removal of the appendix, a catheter is inserted into the bowel through the stump and brought out through the abdomen, thus at once establishing an artificial opening for escape of accumulated flatus and liquid bowel content. The catheter is of a size as large as the stump will admit, is fastened by 2 small catgut sutures and a purse-string suture about the stump, and is then inverted in much the same manner as a gall-bladder drainage tube. In a few days, additional adhesions wall off the stump and tube thoroughly from the general peritoneal cavity. The tube usually comes away on the 6th or 7th day, and the fistula closes promptly. The period elapsing until fecal drainage ceased appearing in the dressings in the writer's cases ranged from 3 to 27 days. There was very little nausea and vomiting in these cases. General supportive treatment was also given, *viz.*, much **fluid subcutaneously** or **intravenously**, **hot packs**, and enough **morphine** to insure rest and to steady the pulse.

#### APPENDICITIS, CHRONIC.—

Doubt is being expressed by some as to whether chronic appendicitis actually occurs as an independent clinical entity. At any rate, appendectomy in supposed chronic appendicitis has frequently failed to relieve pain and tenderness in the right lower quad-

rant. As noted by Carnett (Amer. Jour. Med. Sci., Nov., 1927), floating right kidney, Jackson's membranes, Lane's kink, mobile cecum, pericecal or colonic adhesions, cecal stasis and dilatation, incompetent ileocecal valve and post-operative adhesions have all, in turn, been held responsible for the absence of relief in these cases; each of these conditions may cause symptoms occasionally, but even when taken together, they have not proved to be the common cause of right-sided chronic pain.

According to Hertzler (Amer. Jour. of Obst. and Gyn., Feb., 1926), who reports a study of 3000 appendices, fibrotic changes in the appendix do not cause clinical symptoms. The appendices commonly removed under the diagnosis of chronic appendicitis show no variation from those of individuals free of all abdominal complaint. The minimal changes alleged to be present in cases of so-called chronic appendicitis are wholly inadequate to explain the symptoms ascribed to them. Mere alleged relief of symptoms after appendectomy is not sufficient to prove that the appendix was the cause of the symptoms. The symptoms attributed to chronic appendicitis can be overcome by searching out the actual cause and removing it, without molesting the appendix.

Koster (Arch. of Surg., Jan., 1928) asserts that from a purely pathologic basis it is not correct to group all the conditions causing a dull aching pain or intermittent and colicky pain in the right lower quadrant as "chronic appendicitis;" nor is it fair to assume that unless appendices show all evidences of chronic inflammation they

cannot cause the symptoms. Until it becomes possible to differentiate the symptoms produced by chronic appendix inflammation from those caused by kinks, adhesions, strictures, etc., the term "chronic appendicitis" had better, pre-operatively, be discarded and replaced by "appendicular colic."

Butka (Cal. and West. Med., Apr., 1927) maintains that complete data on gross conditions seen at operation are essential to a correct diagnosis of chronic appendicitis, which can be determined by histologic examination alone in only a very small percentage of cases. Obliterative and atrophic appendices are not found in increased numbers in cases diagnosed clinically as chronic appendicitis. The latter often rests more on a functional than a pathologic basis. The presence of eosinophiles in the mucosa of the appendix is not an indication of chronic appendicitis, but is normal and probably a link in the defensive mechanism. Eosinophiles and leukocytes in the submucosa and muscularis, however, are positive evidence of inflammatory changes.

W. J. Mayo (Surg., Gyn. and Obst., May, 1926) believes that chronic appendicitis may exist without clinical evidence or previous history of an acute attack, and states that there are at least 2 well-defined types of chronic appendicitis. In the 1st type, the appendix contains concretions, often of considerable size. Occasionally, in unexplained hemorrhage from the stomach, an exploratory operation reveals no other cause than such an appendix, and recovery follows appendectomy. Certain careful observers believe that a chronic infection carried from the appendix to the liver is responsible for the hemorrhagic



stomach erosions sometimes found in these cases. In the 2d type, one explores for a perplexing epigastric condition, does not find lesions in the upper abdomen, but brings to light a markedly diseased appendix buried in a mat of adhesions, without any history of an acute attack. Such an appendix is often seen in conjunction with cholecystitis without stones. These 2 varieties of appendicitis, unless there is retention of secretions or local peritonitis, do not cause pain in the iliac fossa, but painful sensations are referred to the epigastrium and are recognized clinically in a considerable group of cases as appendiceal dyspepsia from the associated pyloric spasm.

As shown by Ribbert, between the ages of 25 and 50 years 50 per cent. of all persons show involutional changes in the appendix (a process, when complete, formerly called "appendicitis obliterans"). An appendix of this character cannot be considered pathologic. The neurasthenic, whose attention has been focused on the right iliac fossa by repeated manipulations to elicit tenderness, is sometimes operated on for the removal of an appendix undergoing normal involution, and the expected relief is not forthcoming. Mistakes in diagnosis are made because of overemphasis of the possibility that pressure on a chronically diseased appendix, without localized peritonitis and retained secretions, causes pain at McBurney's point.

According to Payr (Deut. Zeit. f. Chir., Mar., 1927) the reason for the 40 per cent. of failures of appendectomy to bring relief is the frequent confusion in diagnosis resulting from the absence of a typical history and

clinical picture in chronic appendicitis. He considers as evidence of chronic inflammation a stasis in the proximal portion of the large intestine—from enteroptosis, kinking, or adhesions—with widening of the lumen and slight, superficial inflammatory changes in the mucosa; to assume a previous severe infection in the crypts is unnecessary.

H. C. R. Darling (Med. Jour. of Austral., Mar. 20, 1926) labels as "chronic appendicitis proper" cases with pain referred to the epigastric or umbilical rather than to the right iliac region, pressure over the appendix giving rise to this reflex epigastric pain. In the absence of acute appendicitis, pain confined to the right iliac fossa with local tenderness does not denote appendicitis. Aside from true chronic appendicitis, there occurs a condition, commonly diagnosed as "chronic appendicitis," in which there is abiding discomfort in the right iliac fossa with exacerbations accompanied by nausea, sometimes slight fever, and more common in women. These cases are not appendicular in origin, but are all associated with *enteroptosis*. Nearly always, symptom-producing chronic appendicitis is of a mechanical nature, being due to anatomic conditions interfering with free drainage of the appendix. These conditions comprise mobile cecum, ptosis of the cecum, ptosis of the right flexure, mobile ascending colon, Jackson's pericolic or parietocolic membrane, and double-barreled union of the ascending and transverse colon. In long-standing cases with permanent intestinal stasis, there gradually appear symptoms due to toxic absorption. Along with almost continuous

pain and superadded attacks of pain tending to radiate into the right flank, lumbar or hepatic regions, there is constipation alternating with attacks of pain and diarrhea; doughy or half-liquid fetid stools; hard scybala during the periods of constipation; cephalalgia which increases as the day goes on; lack of concentration; nausea and occasional vomiting; emaciation; pyorrhea and skin pigmentation; increased and offensive sweat secretion; easily exhausted muscles, and weak heart-action.

**DIAGNOSIS.**—The close relationship between chronic appendicitis and colitis is emphasized by I. Boas (Med. Jour. and Rec., Jan. 6, 1926). Cases of chronic appendicitis with complete integrity of the colon are extremely rare. Many patients, after appendectomy, continue to suffer from disease of the cecum. The colon disturbances are not secondary to the appendicitis, for cases in which chronic obstipation or colitis is cured by appendectomy are very rare. The close relation with colon disturbances makes it impossible for the disease picture of chronic appendicitis to be sharply circumscribed and well defined. A definite diagnosis of chronic appendicitis can be made only by exclusion. Reliable conclusions cannot be drawn from McBurney's or other special points of tenderness. The confusing skin hyperalgesia may, as such, lead to appendicitis-like symptoms, and when it is present one should seek for corresponding hyperalgesic zones in other regions of the abdomen, the finding of many such areas pointing to a pseudo- or psychogenic appendicitis. To differentiate a mere skin hyperalgesia from deep-seated tenderness, the writer finds valuable a

treatment of the hyperalgesic zones with Bier suction cups. If the sensitive area is made hyperemic twice daily for 3 or 4 days for periods of  $\frac{1}{2}$  hour each, the skin hyperalgesia disappears, while the deep tenderness remains. He has thus been able to eliminate a large number of cases of pseudoappendicitis. A point of tenderness in the vicinity of the attachment of the appendix is especially significant in cases of "appendicular colic," characterized by sudden attacks of severe pain over the whole abdomen, disappearing after a few hours, but leaving in their wake a distinct subjective and objective tenderness in the vicinity of the appendix, which remains for several days and then recedes.

A tenderness not strictly confined to the appendix region loses all diagnostic significance. Absence of a point of tenderness at or near the point of attachment of the appendix does not exclude chronic appendicitis. In healthy individuals, careful palpation of the cecum and its surroundings is entirely painless. Slight rises of temperature may have a certain diagnostic significance; there may be either transient rises of temperature in acute exacerbations of chronic inflammation, or persistent slight rises. Persistence of X-ray contrast medium in the appendix for several days after clearing of the colon with a purgative is of considerable diagnostic import. Latent or slightly developed *inguinal hernia* may simulate chronic appendicitis; the writer has relieved many such cases with a truss.

J. B. Carnett (Amer. Jour. Med. Sci., Nov., 1927), having for years been endeavoring to ascertain the common cause of chronic pain and

tenderness in the right lower abdomen, believes the answer to the puzzle to be found in the abdominal wall and not within the abdomen. Palpation with the anterior abdominal muscles voluntarily held tense shows that tenderness occurs in the abdominal wall more often than it does inside the abdomen. Tenderness present with relaxed muscles and absent with tensed muscles, however, points to an intraabdominal lesion. Beginning with gentle palpation over relaxed muscles, the writer, finding no evidence of an intraabdominal lesion, finally resorts to vigorous poking with the end of his middle finger at about a right angle to the surface, over the tensed muscles, thus bringing to light many otherwise unsuspected cases of parietal tenderness. The tensing of the muscles is effected by having the supine patient actively raise the head, or better, raise both heels with the knees extended and keep them held above the surface on which he is lying.

Pain and tenderness of the anterior abdominal wall, especially when chronic, are most commonly due to *intercostal neuralgia*, this term being used, pending a better one, as including all lesions of the spinal cord, meninges, vertebræ and nerves themselves which can cause pain in the intercostal and 1st lumbar nerves. That the tenderness disclosed by palpation over the tensed muscles is due to such neuralgia and not to some other parietal lesion is evidenced mainly by finding tenderness (1) on pinching abdominal skin and fat; (2) upon pressure on intercostal nerve-trunks, and (3) upon pressure over areas supplied by intercostal nerve-fibers away from the abdomen. The

maximum pain and tenderness of neuralgia may be situated anywhere over the anterior parietes, but most often in the lower abdomen and, if unilateral, is usually on the right side. In pseudoappendicitis the tenderness usually extends more or less widely over a triangular area bounded by the midline, a transverse line from the umbilicus to the iliac crest, and a 3d line parallel to Poupart's ligament. Within this area are certain points of greater sensitiveness along the outer edge of the rectus muscle, where the intercostal nerve-branches penetrate the transversalis fascia and aponeurosis to enter the rectus. When the lower abdominal tenderness is bilateral, precluding a check of the sensory findings by comparing like areas on the opposite side, the comparison may be made with the upper right or left quadrant or, if these are hypersensitive, with an area over the lower chest wall. Even when the hyperesthesia, as evidenced by the pinch test, is confined to the lower right quadrant, it is very common to find tenderness of intercostal nerve trunks as high as the 6th or 5th, or even up to and including the 1st. The tenderness is not uniform along the nerve trunk but seems to occur in "tender points."

Long-continued tenderness at McBurney's point absent over tensed muscles does not prove the presence of chronic appendicitis, as in Carnett's experience it is most commonly retroperitoneal, *viz.*, a tenderness of the palpable vertebræ and sacroiliac joint. Visceroptotic individuals supply the bulk of chronic pseudoappendicitis cases on whom appendectomies are performed without relief. Symptoms of visceroptosis simulating chronic

appendicitis can, on careful analysis, usually be classified under (1) digestive disturbances due to ptosis and intestinal stasis; (2) deep-seated tenderness at or near McBurney's point, due to chronic strain of the lumbar spine and sacroiliac joints, or (3) intercostal neuralgia of the anterior abdominal wall, due to lumbar lordosis and possibly also to intestinal toxemia. Often 2 or all 3 of these groups coexist.

Roentgenologic reports as to the presence of chronic appendicitis are often misleading. Fluoroscopic observations of tenderness moving with the appendix are valueless, unless coupled with the finding that the tender areas lose their tenderness when the appendix is displaced from them. H. K. Pancoast is quoted as regarding the undoubted X-ray evidence of an adherent appendix as the only safe sign of appendiceal disease. The roentgenologist's report should deal entirely with adhesions, including, if possible, a description of the manner in which the appendix is bound and to what structures and its location. One must be sure that the appendix is visible by films as well as the fluoroscope; it may be closely simulated by partly filled ileum, sigmoid or cecum. The only worthwhile evidence of appendiceal disease is pyloric spasm coupled with an adherent appendix.

Carnett concludes that from painstaking research of patients and of appendix literature he has been unable to find a symptom-complex which warrants a preoperative clinical diagnosis of chronic appendicitis and which will be relieved by appendectomy. Patients with right-sided chronic pain and tenderness present

pictures that are uniformly consistent with intercostal neuralgia but not consistent with any other single affection. Further, while an extensive incision for appendectomy may occasionally reveal an otherwise unsuspected gastric or duodenal ulcer, biliary disease, a renal or ureteral affection, or pelvic disease, Gibson's figures indicate that wide exploration is not a panacea for "rightsiditis." In the writer's experience, intercostal neuralgia has been the usual cause for multiple abdominal operative scars.

Darling (Med. Jour. of Austral., Mar. 20, 1926) asserts that *X-ray examination* is essential for the accurate diagnosis of all chronic affections of the right iliac region, though it is no less important to control the X-ray data by the clinical findings. Laying stress on right-sided enteroptosis as the cause of appendix symptoms, he notes that by X-ray study of the whole colon the seat and nature of the lesion can usually be determined. The situation, size and form of the colon should be investigated, 1st in the vertical and then in the horizontal position. Mobility of the colon should be determined by palpation with the patient in various positions. Normally, there is a difference of about 3 inches (7½ cm.) in the level of the cecum in the standing and Trendelenburg positions. In enteroptosis the difference may be twice as great. The cecum can often be displaced from the side of the rectum to the level of the anterior superior spine and across the midline. While the patient is in the left lateral position, a loaded mobile ascending colon may be seen with the screen to sag to the left iliac fossa. Palpation may



reveal many points of tenderness all around the cecum or along the median or lateral borders of the ascending colon. The positions of the head and tail of an opaque meal ingested 14 hours previously should be studied and examinations made every 1 to 2 hours. In the absence of any obstruction, a notable quantity of residue in the cecum after 15 or 16 hours suggests cecal stasis. In determining whether the appendix is diseased or not, attention should be paid to its filling and emptying, its shape, mobility, position and the presence of concretions, hyperacidity, spasm or tenderness.

According to Payr (Deut. Zeit. f. Chir., Mar., 1927), when chronic appendicitis and enteroptosis are to be differentiated, the application of treatment appropriate for the latter should provide an answer. Massage and athletics may be employed as provocative measures to clear up the diagnosis.

G. Guénaux and P. Vasselle (Paris méd., Feb. 5, 1927) state that the appendix is visualized with barium taken by the mouth in about  $\frac{2}{3}$  of all cases. Such visibility has no more clinical significance than non-visibility. Visibility has as its main advantages the determination of the position of the appendix with relation to the cecum and the accurate localization of the pain. Only rather infrequently does the appendix show morphologic abnormalities sufficient to indicate disease of the organ. Vacuoles and diverticula of the appendix should be regarded as betokening cysts, abscesses or calculi, but should be definitely accredited only when recurring on several successive X-ray pictures taken some hours apart. Not too

much attention should be paid to a kink of the appendix, a stump-like aspect, uneven filling, or fixation of the tip. The tip of the appendix may be fixed in the absence of appendicitis; in 1 such case, the tip was fixed near a mesenteric gland and the pain was merely a celiacgia. Immobility of the floor of the cecum is highly significant, being due nearly always to peritoneal reactions caused by appendicitis.

According to M. J. Hubeny (Ill. Med. Jour., Sept., 1926), the normal appendix can usually be visualized if one waits long enough. In general, the appendix incapable of being filled is more pathologic than the one that can be visualized. In fluoroscopy, occasionally the Trendelenburg position is needed to release a pelvic cecum which might be incarcerated or possibly adherent. The plate method should also be used, sometimes giving additional information. At times, stereoscopic plates are indicated, whereby a retrocecal appendix or one in close proximity to the cecum or ileum can be traced. As the appendix possesses peristalsis, the X-ray demonstration of appendiceal retention or rapid expulsion of barium is of diagnostic value. Because of its anatomic relation to the cecum, the location of the appendix can be determined approximately even when it is not visible on the plate or screen.

A. Fraikin (Paris méd., Apr. 30, 1927) describes a *spasm of the cecum*, visible fluoroscopically, as a diagnostic evidence of chronic appendicitis in conjunction with an appendicular point of tenderness and complete or partial loss of permeability of the appendix. The spasm is limited to the cecal fundus and the cecal border

where the appendix is inserted. It is visible 6 or 7 hours after ingestion of the barium meal, and appears as a narrowing or caved-in aspect of the cecum at its fundus and internal border, so that the cecal shadow looks like an inverted sugar-loaf or a crescent. This appearance should, of course, not be confused with that caused by a neoplasm, adhesive bands fixing the cecal fundus, or compression of the cecum. The spasm is differentiated by the fact that it is transient. Sometimes it is not seen at the beginning of the examination, but appears only when the cecum is palpated. Sometimes, upon palpation, the cecum ejects all of its opaque medium content into the ascending colon. The spasm is not confined to adherent cecums, but is frequently seen in non-adherent or mobile cecums. A barium enema reaches the cecum without difficulty, but then seems checked, and colic is felt. Stopping the flow, gentle massage of the cecum, and turning the patient on the right side for a few moments generally overcomes the cecal resistance. Upon resumption of the flow, the cecum then fills completely without any filling defect, showing that the condition had been merely one of transient spasm.

*Chronic cholecystitis* is stressed by F. Ramond and G. Parturier (*Presse méd.*, June 5, 1926) as a source of diagnostic error. Such cholecystitis, which may be due to a variety of causes, may simulate chronic appendicitis in several ways. A ptotic inflamed gall-bladder may lodge in the right iliac fossa, close to the appendix, and suggest disease of the latter. Again, insufficiency of bile or infected bile may induce intestinal disturb-

ances localized particularly in the cecum and rendering the latter sensitive. Further, the gall-bladder pain may, reflexly, bring about painful spasms of the colon, especially the ascending colon and cecum. The greatest source of confusion, however, is the almost constant presence in chronic cholecystitis of the right celiac point of tenderness, corresponding to Morris's para-appendicular point. Conversely, appendicitis may simulate cholecystitis. Subhepatic appendicitis arises through mobility of the cecum or high implantation of the appendix, and malposition of the latter undoubtedly favors appendicitis. Extension by ascending omental lymphangitis is not exceptional; Moynihan, P. Duval and others account thus for the relative frequency of appendicitis with periduodenitis and pericholecystitis. In 1 case, moribund on admission, the writer found at autopsy a long lymphangitic process starting from a gangrenous appendix, ascending along the mesenteric vessels, and spreading out behind the duodenum, beneath the root of the mesentery. Finally, appendicitis and cholecystitis sometimes co-exist, without it being possible to say whether one of them is primary or whether both are the expression of the same digestive tract infection.

According to Chase (*Can. Med. Assoc. Jour.*, Apr., 1927), *diverticula of the appendix* are more common than is generally realized, and account for the cases of so-called subacute appendicitis recurring for a period of months or years and ending unexpectedly and rapidly by perforation that is otherwise unexplainable.

In a case recorded by A. Dami (*Policlin.*, June 14, 1926), symptoms of

chronic appendicitis and constipation with exacerbations were found due to an *internal hernia* of the small intestine situated between the end of the ileum and a fold of peritoneum connecting the latter with the cecum and appendix.

A case of *spontaneous amputation of the appendix* clinically diagnosed as chronic appendicitis is reported by Kirkwood (Boston Med. and Surg. Jour., Nov. 24, 1927). After having had some attacks of moderately severe pain in the lower right quadrant for several years, the patient had a more severe attack requiring operation. The 3 teniæ at the base of the cecum were seen to converge smoothly and a detached appendix 2 cm. long was found. It was microscopically the seat of a chronic and healing appendicitis.

**TREATMENT.**—As regards the **conservative treatment**, after the differential diagnosis from other surgical conditions has been carefully gone into, R. J. McN. Love (Lancet, Apr. 2, 1927) urges consideration of the teeth, diet, and mode and habits of life, particularly as to smoking, overwork and lack of exercise. Conservative treatment should particularly be considered in neurasthenics and elderly patients, especially females. If improvement is unsatisfactory, **operation** is to be seriously considered, especially (1) in recurrent cases, particularly if colic is well marked, as the diagnosis is then usually correct; (2) in children; (3) when the appendix, if diseased, may be exerting a malign influence on other organs, such as the stomach and colon; (4) in a few cases, if a family predisposition to acute appendicitis exists, and appendicular symptoms occur. The most suitable **incision** is the right paramedial, permitting of exploration of the whole abdomen. It starts at the level of the umbilicus, 1 inch from the

midline, and extends downward for about 4 inches. The anterior sheath of the rectus is divided and the muscle retracted outward. If conditions other than appendicitis are found, amenable to surgery, the incision may be prolonged in either direction. Spheroidal-celled *carcinoma of the appendix* was found by the writer in 2 cases out of 750 appendectomies. It is usually revealed by superimposed acute infection, and is relatively innocent, secondary deposits being recorded in only 12 per cent. of the cases.

I. Boas (Med. Jour. and Rec., Jan. 6, 1926) gives the same 4 indications for operation as Love, with the exception that in the 3d indication, he refers to "adults in whom the differential diagnosis between appendicotyphlitis or appendicocolitis and appendicitis is impossible." As typhlitis calls for measures quite different from those required in chronic appendicitis, only after **appendectomy** can one stand on firm ground therapeutically. No doubt, one thus occasionally removes an appendix unnecessarily, but it is better to do so than be constantly shifting about diagnostically and therapeutically; the end will be appendectomy whether one wishes it or not.

According to H. Haberer (*ibid.*), both membranous enteritis confined to the cecum and stercoral and ulcerative typhlitis are frequently confused with chronic appendicitis, as are also cecum mobile, dilated cecum and cecal atony. Surgical chaos, in the form of unnecessary operations, often results. In actual chronic appendicitis, represented by cases with one or more acute appendix attacks followed by chronic change in the appendix which continually produces symptoms,

**appendectomy** is naturally indicated. There are also cases of **actual chronic** appendicitis without any previous acute attacks, including the cases called by Ewald appendicitis larvata, cases of chronic adhesive appendicitis, and some rare cases of so-called indurative appendicitis. In the diagnosis, sometimes very difficult, of this 2d group of cases, the writer attaches great importance to exclusively local tenderness and the X-ray findings of an expert. In this group appendectomy is again indicated, with the addition of a partial intestinal exclusion through **lateral ileocolostomy** in those occasional cases of indurative appendicitis in which the adhesions have drawn into themselves portions of the lower ileum or quite large portions of the cecal wall. In a 3d group of cases, *viz.*, those in which chronic appendicitis is only a partial phenomenon in a typhlitis, it cannot be predicted in the individual case whether appendectomy offers any hope of success; the removal of the appendix will, at any rate, do no harm.

The safest criterion of permanently beneficial results from operation, according to S. L. Immerman (*ibid.*, June 1, 1927) is a history of an acute attack. There is still too great a tendency to remove the appendix for chronic digestive complaints. Seeing each year at a stomach clinic a number of appendectomized patients with symptoms unrelieved, some operated on by prominent surgeons, the writer deems it advantageous to classify these failures, to get a better idea of the cases in which appendectomy is not to be recommended. There are 7 groups of failures: (1) Constitu-

tional group, the patients suffering from anemia, Bright's disease, goiter, etc. (2) Constipation group, with symptoms due to constipation or its results ("autotoxemia," cecal stasis, etc.). (3) Ptosis group, including movable cecum, bands and adhesions; the majority are not benefited by appendectomy. (4) Chest group, especially cases of so-called mild or apparently arrested pulmonary tuberculosis, appendectomized on account of abdominal symptoms. (5) Nervous group, comprising neurasthenia not due to appendicitis, and other nervous disorders, including tabes and other cord diseases. (6) Incorrectly diagnosed group, with gall-bladder disease, peptic ulcer, chronic pancreatitis, liver diseases, renal calculus, arteriosclerosis, lead poisoning, migraine, hernia, or chronic colitis. (7) Orthopedic group, including chiefly diseases of the hip and spine. Every operation for the chronic appendix should include a thorough exploration.

According to R. J. Harrenstein (Med. Tijd. v. Gen., June 19, 1926), *insufficiency of the ileocecal valve is at the bottom of some of the disturbances attributed to chronic appendicitis*. This is indicated by such cases as that of a weak, constantly anorexic child, whose appetite improved remarkably after appendectomy, although the appendix was quite normal. Study of the ileocecal valve region in 57 child cadavers supported this view. Evidently, mechanical conditions relating to the valve are improved by the usual mode of dealing with the stump of the appendix. In man and the monkey, with their erect posture, the valve is particularly called upon to prevent reflux of food into the ileum. Removal of the appendix eliminates a cause of reflex disturbance of the functioning of the ileocecal valve.



J. D. Willis (Va. Med. Mthly., Sept., 1926) includes chronic appendicitis among a group of intestinal infections involving the ileum, cecum and colon and following *visceroptosis*. The intestinal stasis and disturbance of circulation resulting from the latter condition predispose to a low-grade infection. In such cases operation is rarely beneficial, but the symptoms may be relieved by regulation of the bowels by **diet and exercise**. Regular daily bowel habits should be instituted, and any spasm of the rectal sphincter dilated sufficiently to correct it. **Much water** should be taken and **abdominal exercise** carried out. **Liquid petrolatum, agar or psyllium seed** is often of great benefit, and occasionally, **injections of oil into the colon** are of value.

Our Associate Editor, R. T. Morris (Amer. Jour. of Surg., Dec., 1926), recognizes 5 kinds of chronic appendicitis, all of which are benefited in some of their features by **physical therapy**. (1) The commonest is "fibroid involution" of the appendix, which, through pressure on nerve filaments, irritates the 2d and 3d sympathetic ganglia ("fused ganglion") on the right side, with resulting disturbed bowel function. In these cases, where the patient is past middle life, physical therapy will commonly relieve, but occasionally appendectomy becomes necessary; where the patient is younger, with stigmata such as high-arched palate, crowded teeth, etc., appendectomy is seldom desirable, and may increase distress. (2) Cases in patients with relaxed peritoneal supports and endocrin dysfunction. The sagging colon and stretched mesentery so obstruct the venous circulation of the cecal region that the appendix becomes chronically congested and swollen, and attracts attention be-

cause of local pain. Here measures for reducing the congestion mechanically or otherwise are to be applied, not surgery. (3) In this group there is irritation due to contraction of scar tissue following an earlier acute infection. Operation is sometimes desirable, and may be imperative if much appendix lumen has remained. Physical therapy will often relieve complications relating to the irritation feature, but not to the infective feature. (4) In cases of lymphoid hypertrophy of the appendix, often in very young patients with status lymphaticus, appendectomy, while relieving the appendix pain, involves dangers owing to the lymphatic state. Physical therapy improving general health and resistance is the natural indication. (5) This group relates to a catarrhal appendix inflammation forming part of a similar inflammation of the cecum and colon in general. Here again surgery is inadvisable. Physical therapy aimed at the "rheumatism" or other causes of the chronic congestion of the colon mucosa are called for, along with **hygiene, diet, medication, and treatment of foci of infection**.

**ARRHYTHMIAS.—AURICULAR FIBRILLATION.**—Where this disturbance is at all persistent, its presence is commonly considered as indicating important myocardial damage. W. D. Reid (Boston Med. and Surg. Jour., Dec. 29, 1927) has, however, published a case showing that auricular fibrillation persisting for years may occur *in a heart* that is *clinically normal*. The patient was a man of 32 years, in whom fibrillation had set in after an automobile accident, following which he had carried

an injured woman up 3 flights of stairs. The condition became worse after an attack of "flu" about a year later, subsequent to which he was never able to work for more than 2 hours at a time. Digitalis was given in inadequate dosage, and the arrhythmia persisted for 2 years and 8 months, following which normal rhythm was promptly restored by quinidine sulphate, and the condition did not return in the succeeding 10 months. Reid adds that while no lesion is constantly associated with auricular fibrillation, as a rule there are scattered foci of chronic inflammation, which tend to congregate in the auricle. In some hearts, however, these lesions are not found.

That occasionally, in auricular fibrillation, the ventricles, though beating at a rate of 60 or more, may for varying periods *contract regularly* is pointed out by R. L. Levy (Arch. of Int. Med., July, 1926). He reports 4 such cases, observed within a period of 3 years. In 1 patient the change of rhythm occurred 5 times at intervals of a month or more; in another, 3 times in as many weeks. The regular rhythm lasted from a few hours to several days. Fifteen such cases, in which the rate was over 55, were found in the literature. The condition has diagnostic import, since it suggests a spontaneous return to normal rhythm. In fact, opinion to this effect had been expressed in 2 of the writer's cases, until an electrocardiogram revealed that the auricles were still fibrillating. All of the 19 cases under consideration were receiving digitalis at the time. As to the cause of the regular contractions, evidence may be adduced in support

of the existence of either complete or partial auriculoventricular block; final proof of either hypothesis is lacking.

Studying the *blood-flow* during experimental auricular fibrillation in 10 dogs, H. J. Stewart, J. H. Crawford and A. B. Hastings (Jour. of Clin. Invest., Dec. 20, 1926) found it decreased from 20 to 62 per cent. during the fibrillation. The oxygen saturation of the arterial blood remained unchanged, but that of mixed venous blood decreased, during the fibrillation.

**ETIOLOGY.**—The importance of recognizing the presence of auricular fibrillation in cases of *hyperthyroidism* is emphasized by J. P. Anderson (Amer. Jour. Med. Sci., June, 1927), of the Cleveland Clinic. The occurrence of cardiac disturbance does not appear to depend upon the pathologic type of goiter—whether diffuse hyperplastic, fetal adenomatous, or colloid goiter with adenomatous nodules,—but rather upon the hyperthyroidism itself. It is commonest, however, in colloid goiter with adenomatous nodules, especially in individuals over 45 years of age in whom some degree of arteriosclerosis is already present. Yet in some cases thyroid adenomas and adenomatous goiters appear to cause cardiac damage even before hyperthyroidism becomes manifest and before the basal metabolic rate has risen to a level indicating its presence. Sometimes, after years of nervous spells, loss of weight and palpitation due to goiter, auricular fibrillation suddenly sets in, obliging the patient to stop work or go to bed. The cardiac condition in goiter *must* be recognized early, in order that radical treatment may be instituted before serious heart damage has taken place.

According to J. Hay and H. W. Jones (Brit. Med. Jour., Mar. 26, 1927), *trauma* or *physical strain* may be the exciting factor in auricular fibrillation. Among 5 such cases, in 1 the fibrillation was due to a powerful electric shock; the man had been perfectly healthy, but the fibrillation continued after the accident until broken by **quinidine**. In the other 4 cases the exciting factor was sudden physical exertion. In 3 of these 4, there was no heart disease on ordinary clinical examination, nor any subjective symptoms previous to the onset of fibrillation. The other case had slight aortic regurgitation and a right bundle lesion in the electrocardiogram, but until the accident had continued his ordinary occupation in comfort. Then, while lifting a heavy object, he suddenly "felt something give" in his chest, at which time fibrillation began, persisting so that he had to give up his occupation. Evidently, auricular fibrillation may follow sudden strain both in apparently normal and in diseased hearts.

Auricular fibrillation in *abdominal diseases* is discussed by Felberbaum and Finesilver (Amer. Heart Jour., Apr., 1927), who observed 6 cases in gall-bladder diseases, acute appendicitis, recurrent gastric ulcer, and in 1 case of extensive post-operative adhesions. The attacks of fibrillation came on only during the acute stages of these disorders, and are ascribed to *toxemia* from septic foci in the abdomen. Masked infections may be suspected to be the cause of many cases of auricular fibrillation in apparently healthy persons. In the abdominal cases **removal of the diseased organ** was generally followed by permanent

disappearance of the fibrillation. Occasionally **quinidine** is valuable.

Eighteen cases of *pregnancy* complicated with auricular fibrillation are reported by A. L. Robinson (Lancet, Jan. 22, 1927). Thirteen died before, during, or soon after delivery. All the cases had heart failure and mitral stenosis, with an added aortic lesion in 3 cases. The combination of mitral stenosis and pregnancy is peculiarly apt to set up heart failure, because obstruction in the pulmonary circuit is produced by the valvular defect and also by the selective pressure effects of the pregnant uterus. The ultimate result depends on the quality of the heart-muscle and the amount of reserve power it retains. The injurious effects of pregnancy are progressive and cumulative, increasing, often rapidly, as term approaches and culminating in the supreme strain of labor. A heart without reserve power cannot withstand parturition. In cases without heart failure, if the cardiologist estimates the reserve as satisfactory and the patient will remain under observation, pregnancy may be allowed to continue, subject, however, to termination if there are beginning signs of defective reserve, before the onset of actual heart failure. In cases with heart failure, termination of the pregnancy is justifiable only when compensation has been reestablished by **rest, digitalis**, etc. For many cases **Cesarean section** is the best procedure, especially in primiparæ or where there is some complication such as contracted pelvis or an abnormal presentation. In patients whose cardiac reserve is almost perfect, permitting of the playing of games and leading an active life when not pregnant, normal de-

livery at term may be safely allowed, although **induction of premature labor** and the use of **forceps** are always useful procedures, as they mean less strain on the heart.

**PROGNOSIS.**—Auricular fibrillation, according to H. W. Jones (Lancet, Sept. 25, 1926), is of more serious significance in senile than in rheumatic heart disease. In mitral stenosis its presence makes little difference as to the expectation of life. In aortic regurgitation the prognosis is better when fibrillation is present than with a normal rhythm. With marked cardiac enlargement the outlook is more grave. The expectation of life is longer in females than in males. In the electrocardiogram the presence of a bizarre Q.R.S. complex is of most significance in the prognosis.

A case of auricular fibrillation of 15 years' duration has been reported by E. E. Laslett (Lancet, June 18, 1927). At the time of its onset the patient was nearly 50 years of age and already showed signs of a failing heart. She had had rheumatic fever 20 years before. Her heart responded readily to **digitalis**, which she received throughout the 15 years of fibrillation. Cowan has recorded another case in which fibrillation was known to exist for nearly 12 years. Four years after its onset, she had her 6th child. She died at 39 years.

**TREATMENT.**—In **digitalis** treatment, enough of the drug must be used to stimulate the vagus up to the point of producing an auriculoventricular block just sufficient to allow impulses to pass at normal speed from auricle to ventricle. When block exceeds this in degree, as noted by G. J. Langley (Brit. Med. Jour., June 11, 1927), and particularly when coupled beats, *i.e.*, bigeminy, arise, the vagus is being overstimulated and

vomiting is near. The dose usually required for patients up and about and following the light occupations that fibrillation will generally allow, is 30 minims (2 c.c.) daily, in 3 doses. The drug should not be expected to overcome the chaotic irregularity of the pulse, but it either greatly reduces or abolishes the difference of rate between the apical and radial counts.

A case reported by W. D. Stroud (Atlantic Med. Jour., Mar., 1927) suggests the need of some care in insisting that a patient with fibrillation change to an easier, but unfamiliar, occupation. Sometimes he can carry on more easily at the harder, but familiar, work. An ornamental stone cutter, using a 2½ pound hammer, with rheumatic heart damage and fibrillation, remained in about a stationary condition for 5 years in spite of continuing his work. For 4½ years he took between 20 and 30 drops of **digitalis** tincture 3 times a day, during which time the heart-rate remained between 88 and 124. In each patient the dosage should be adjusted to that amount which will maintain an *apical* rate yielding the most efficient circulation. If the dosage is regulated by the pulse it will be wrong in most instances, for with an apical rate of 100 or more there may be a pulse rate of 66, which would make one afraid to increase the dosage. It is almost impossible to tell by auscultation whether a heart controlled with **digitalis** has assumed a regular sinus rhythm. The spaces between beats may seem exactly equal, yet the electrocardiogram shows that they are not. It should be kept in mind, however, that auricular fibrillation rarely clears up under



digitalis unless it is paroxysmal, or transient following auricular flutter.

Assuming that there is fibrillation with an apical rate of 150, A. J. S. Pinchin (Post-Grad. Med. Jour., Aug., 1926) puts the patient to bed and gives 20 minims (1.25 c.c.) of **digitalis** tincture 3 to 4-hourly, and has both the pulse and apical rates charted. The 2 curves should approximate and descend to the optimum rate of 60 or 70. At this point careful watching is needed, for the pulse may increase again from digitalis poisoning. When the ventricular rate is normal, the question is to be considered whether it is advisable to obtain a reversion to normal rhythm with **quinidine**. This drug may be regarded as useful (1) if there is no evidence of structural damage in the cardiogram; (2) in cases of recent onset—although these may clear up spontaneously; (3) in cases without serious valvular defects, and (4) in Graves's disease if the heart-muscle is fair and operation is in view. Quinidine is contraindicated in mitral stenosis, infective conditions of the heart, badly damaged hearts, where the heart cannot be controlled with digitalis, and where anginal attacks have ceased with the onset of fibrillation. In using quinidine the writer begins with 5 grains (0.3 Gm.) and increases this daily by the same amount until 30 grains (2 Gm.) are given on the 6th, and 40 grains (2.6 Gm.) on the 7th day, in 3 doses. If the rhythm reverts to normal, the dose being given at the time is maintained for 2 days and then decreased rapidly to 5 grains a day. In using quinidine treatment, the patient should be allowed to get fairly free of his digitalis, and the heart condition had

better be controlled by occasional electrocardiograms.

Rationing with **quinidine sulphate** for recurrent fibrillation proved helpful in a case reported by J. E. Talley (Atlantic Med. Jour., Jan., 1926). This patient had chest and arm pains regularly during fibrillation, but none during regular rhythm. The average prophylactic dose of quinidine required gradually increased in the course of about 5 years from 3 grains (0.2 Gm.) to 6 grains (0.4 Gm.) twice daily (at 10 a.m. and 10 p.m.). The rate of the regular rhythm was usually kept near normal by this treatment, though occasionally, after physical or mental exertion, a rate of 100 to 150 occurred for a time or a paroxysm of fibrillation was precipitated. The passing from irregular to regular rhythm occurred scores of times in this case without any embolic symptoms. In 2 other cases, maintenance of a regular rhythm by such rationing with quinidine regularly served to keep the patients edema-free; whenever fibrillation was allowed to persist, edema of the legs reappeared. In other patients, distressed by *premature beats* and short runs of *extrasystolic tachycardia*, rationing with **quinidine** kept the pulse regular and the patients comfortable.

According to N. Sidel and F. G. Dorwart (Boston Med. and Surg. Jour., Feb. 10, 1927), where small doses of **quinidine sulphate** have failed, much larger doses than have hitherto been customary can be given, if administered under proper care. The procedure followed by the writers in 20 cases was as follows: Test doses of 3 grains (0.2 Gm.) were first given twice at a 4-hour interval. If signs of idiosyncrasy did not de-

velop, 6-grain (0.4 Gm.) doses, 5 times daily, at intervals of 3 hours, were begun on the following day. If fibrillation persisted after 3 to 5 days on this routine, the dosage was gradually increased. At first 10 grains (0.66 Gm.) were given 3 times daily for 1 day, then 4 times daily for 2 days. If fibrillation continued, 10 grains 5 times daily were given for 2 days, and finally 15 to 40 grains (1 to 2.66 Gm.) 5 times daily. Except in 2 cases, quinidine was omitted in 2 weeks if regular rhythm did not occur. When it did, the dose was reduced to 3 or 6 grains (0.2 to 0.4 Gm.) twice daily; in most cases the drug was finally omitted and the regular rhythm continued. Thirteen of the 20 cases treated reverted to regular rhythm under quinidine. The total dosage effecting regularity ranged from 8 grains (0.5 Gm.) to 920 grains (61.3 Gm.), and the highest total dosage given over a period of 2 months was 3381 grains (225.4 Gm.). Regular rhythm under quinidine resulted in all of the 11 patients with a cardiac history of 2 years or less. All the cases but 1 had had recent heart failure and had become compensated with *digitalis*, etc., before the quinidine was started. Hospitalization is indicated where the large, ascending doses of quinidine referred to are to be given.

*Veratrum viride* has been found by Wedd and Drury (Heart, Mar., 1926) to exert a direct action, similar to that of quinidine, on the auricular muscle of the dog. *Veratrum viride*, as is well known, also has a stimulating action on the vagus which would tend to enhance the rate of the auricular oscillation, whereas its direct action tends to reduce this rate. The relative preponderance of these 2 actions will

determine the resultant auricular rate when the drug is given to patients with auricular fibrillation. In such patients alcoholic solutions of *veratrum viride* were found by the writers to cause slowing of both the auricular and ventricular rates and a fall of blood-pressure. As a therapeutic agent, the drug is somewhat handicapped by uncertainty and irregularity of action. It may be useful in cases in which simultaneous slowing of ventricular rate and lowering of blood-pressure is desired.

In auricular fibrillation associated with *hyperthyroidism*, J. P. Anderson (Amer. Jour. Med. Sci., June, 1927), of the Cleveland Clinic, counsels very careful preoperative treatment where surgical treatment is contemplated. Aside from the usual measures, if signs of heart-failure exist the daily fluid intake should be reduced to 1000 c.c. (1 qt.) and more *digitalis* than is used in the ordinary case, *viz.*, 32 minims (2 c.c.) of the tincture every 4 hours for 6 doses, administered. In auricular fibrillation a regular daily dosage of *digitalis* should be given, the amount being determined by circumstances in the individual case; usually 20 minims (1.25 c.c.) 3 times a day suffices. If anasarca or edema is present, *ammonium chloride*, 15 grains (1 Gm.) 4 times a day for 2 days before using *novasurol*, and throughout the treatment with *novasurol*, should be given; the *novasurol* should be given intravenously, 8 to 16 minims (0.5 to 1 c.c.), every 3 or 4 days.

In auricular fibrillation associated with *hyperthyroidism* in which the former condition is of recent onset the heart action usually becomes regular after *thyroidectomy*; if not, *quinidine* will usually restore normal rhythm. Where auricular fibrillation

of long standing and hyperthyroidism of recent onset coexist, thyroidec-tomy is well borne; although normal rhythm is seldom restored, the rate can be controlled by *digitalis* and the patient's condition much improved. Cases of hyperthyroidism with a grave degree of heart failure, where absolute rest, *digitalis* and Lugol's solution have not cleared up the heart condition, are always desperate risks, yet operation should be performed if there is the slightest hope of success.

**AURICULAR FLUTTER.**—Where this condition is attended with heart-block, according to Pinchin (Post-Grad. Med. Jour., Aug., 1926), whatever the degree of block, as long as it is regular the pulse will be regular, but in the higher degrees a variable block is often observed, periods of 3 to 1, 4 to 1, or 5 to 1 block occurring irregularly, with resulting irregularity of the pulse. Before the heart has failed a venous pulse in the neck will often reveal the condition by its "fluttering," which should be carefully looked for. At the onset of flutter the patient is usually very uncomfortable, complaining of dyspnea, sternal pain, palpitation and cough, and is somewhat cyanosed. During the early stages with a 2 to 1 block and a rapid pulse the condition is less likely to be missed than when the degree of block has increased.

In 1 out of 168 cases of auricular flutter referred to by Willius (Amer. Heart Jour., Apr., 1927), complete heart-block coexisted. In spite of this the patient was able to be fairly active.

While, usually, in flutter, some degree of functional heart-block protects the ventricle from excessive stimulation and fatigue, in a case recorded by G. A. Allan (Glasgow

Med. Jour., Feb., 1927) the ventricle responded to every flutter stimulus, contracting at the rate of 235. The patient had attacks which, without the electrocardiograph, suggested a simple paroxysmal tachycardia, aside from the unusually rapid rate. Mitral stenosis was present, and the condition supposedly of rheumatic origin. In the attacks, there was cardiac pain with palpitation and dyspnea, and in 1 instance, extreme cyanosis. In the latter attack, the rate returned to normal after 6 ½-dram (2-c.c.) doses of tincture of *digitalis* every 4 hours. In another attack, *strophanthin*, ½<sub>200</sub> grain (0.0003 Gm.), was given intravenously, followed by ½<sub>500</sub> grain (0.00012 Gm.) in 4 hours, the attack stopping 8 hours after the 1st dose. Later, because of further attacks, *quinidine sulphate*, 3 grains (0.2 Gm.), was given, whereupon the attack ceased with vomiting. Upon repetition of this dose of *quinidine* on alternate days the attacks became much fewer and responded quickly to treatment.

A case asserted to be the first instance of auricular flutter observed in an *infant* has been reported by Poynton and Wyllie (Lancet, Aug. 21, 1926). The condition was congenital, and the infant early had attacks as of abdominal pain, with circumoral blueness, screaming and drawing up of the legs. Upon admission to the hospital, however, the picture was that of an acute cardiac failure, such as might have followed some infection involving the heart. In spite of the many attacks gone through and the almost constant heart rate of 150, the child was well grown, active and of good color. Complete rest proved the most useful measure. Small doses of *digitalis* were useful, and *quinidine*, when given, slowed the heart, but neither drug obviated recurrences.

Auricular flutter was met with by T. M. McMillan (Atlantic Med. Jour., Mar., 1927) in no less than 39 out of 7000 electrocardiograms taken at the Philadelphia General Hospital during 5 years. The clinical manifestations in flutter vary greatly, apparently depending upon the condition of the myocardium. Some patients are hardly disturbed at all by the rapid heart rate, while others are carried to the last stages of cardiac failure. From experience in treating 25 cases, the writer deems **digitalis** far more valuable than **quinidine** in the treatment. Among the 25 cases, normal rhythm was restored in 20, *viz.*, in 18 by the use of digitalis and in 2 by that of quinidine. Of 6 cases in which the writer has used quinidine, only 3 were restored by it to normal rhythm. Yet, where digitalis has failed, quinidine should always be carefully tried.

**ALTERNATING PULSE OR PULSUS ALTERNANS.**—As an aid in the clinical recognition of this condition, R. S. Morris (Jour. Amer. Med. Assoc., Aug. 14, 1926) considers useful the hearing of only alternate pulse waves on auscultation over the brachial artery (as well as the feeling of only alternate pulse waves at the wrist) at the systolic pressure, while all heart beats produce sounds and pulse waves when the pressure is lowered further. He observed this phenomenon in 13 out of 19 cases. The intensity of alternate sounds over the brachial artery usually showed variation all the way down to the diastolic pressure. The variation was found in patients who later developed pulsus alternans, and such a finding thus becomes a valuable early clinical sign of the condition,

and prognostically useful. It should be kept in mind that the characteristic findings may be seen in patients with a respiratory rate of  $\frac{1}{2}$  the pulse rate and also in cases of bigeminal rhythm with late premature contractions. Alternating pulse in a slowly beating heart is very rare in the absence of other signs of weakening myocardium, such as dyspnea and precordial pain. Alternation in the pitch of heart murmurs or in the intensity and pitch of the heart sounds occur fairly often in patients with constant pulsus alternans, but not often enough to be an important sign of the condition.

**HEART BLOCK.**—That *complete heart block* may occur in the absence of all other evidences of organic or functional heart disease is illustrated in the case of a young man reported by Liljestrand and E. Zander (Acta med. scand., Aug. 31, 1927). The patient was able to do heavy muscular work and take part in athletics. The block is thought to have followed infectious diseases gone through in early childhood. Electrocardiograms showed that the increase of ventricular rate following exercise in this patient was due to acceleration of the idioventricular center and not to premature contractions. Upon cessation of exercise the rate of both the auricles and ventricles rapidly declined to its original level, that of the ventricles somewhat sooner than the auricular rate. Similarly, G. A. Allan (Glasgow Med. Jour., Jan., 1928) records a case of *partial heart block* occurring in a healthy adult free of evidences of heart disease. The block disappeared temporarily upon exercising, as also, usually, upon pressure on the vagus. A deep inspiration



slowed the heart and, if anything, increased the defect. Compression of the eyeballs stopped the whole heart for at least  $4\frac{1}{2}$  seconds.

*Sinoauricular block*, in which a beat of the entire heart is dropped at varying intervals, has been witnessed in 4 cases by P. Barlow (Lancet, Jan. 8, 1927), who gives a tabular summary of the cases published since 1916. It is one of the rarer causes of intermission of the pulse, and is recognizable only by graphic methods. It may take several forms: (a) The heart may intermit occasionally; (b) beats may be separated into groups by its regular recurrence; (c) there may be abrupt slowing or quickening. Sometimes the rhythm is abruptly halved, but more often the rate is slightly more than  $\frac{1}{2}$  the rapid rate; or, there may be rarely a continuous bradycardia of about 30, which is distinguished from other forms of slow action by the way in which the rate accelerates in response to exercise, doubling at once, then quickening gradually, then after exertion slowly decreasing to 80 or 70, and finally halving suddenly to its original rate. Many cases are due to digitalis administration; other suggested causes are tobacco, salicylates and infective conditions. There are no characteristic symptoms. Symptoms of cardiovascular disease may be absent, but the condition is often accompanied by slight grades of auriculoventricular block or other signs pointing to associated myocardial disease. Atropine usually abolishes the block temporarily. Pressure on the bulbus oculi or on the vagus has varied effects.

*Complete bundle branch block* is analyzed by Willius (Amer. Heart Jour.,

June, 1926) on the basis of 105 cases in which electrocardiograms conformed to those of experimental block of this type. In 99 cases there was right, and in 6 left, bundle branch block. The same observer, with N. M. Keith (*ibid.*, Feb., 1927), discusses 3 cases of *intermittent, incomplete* bundle branch block. All 3 had evidence of myocardial disease, but with only slight cardiac enlargement, and dependent edema only in 1 instance. Two cases developed pulmonary edema, but in the other clinical decompensation did not occur. Apparent profound disturbances of ventricular conduction may be evanescent, with or without cardiac decompensation. Along these lines the electrocardiograph may be the 1st and only means of detecting serious myocardial changes.

In 3 cases of right bundle branch block recorded by W. S. Malcolm (Brit. Med. Jour., Feb. 26, 1927), the associated lesions were mitral, aortic (with positive Wassermann), and hypertrophic (with renal cirrhosis); the common factor was myocardial, with degenerative arterial change. Similarly, of 28 cases of bundle branch block reported by Talley and O. K. Reed (Amer. Heart Jour., Feb., 1926), all showed more or less advanced cardiosclerosis. The final breakdown in these cases was averted for months or years by prolonged **periods of rest**. At times, restricted use of **digitalis** was helpful.

**ETIOLOGY AND PATHOGENESIS.**—That a *functional* type of heart block may result from physical strain in competitive athletics, like the nodal bradycardia sometimes noted in athletes, is suggested by the case recorded by P. Meyer (Arch. des mal. du cœur, Dec., 1925). There were no symptoms nor clinical or X-ray signs,

yet electrocardiograms showed conduction delayed to nearly twice the normal time. The functional nature of the block was evidenced by its disappearance after exercise and under atropine.

According to A. S. Hyman (Med. Jour. and Rec., Dec. 1, 1926), *influenza* should be grouped among the acute infections which leave their imprint indelibly on the myocardium and conducting mechanism. Heart block of the 1st degree, with delayed conduction, is not infrequent during or after the severe acute infections, including influenza. Block of the 2d degree, with intermission of the pulse, may follow a mild influenza. Block of the 3d degree, with complete dissociation, may occur in an already badly damaged heart as a result of influenza. Electrocardiographic studies are indicated in all cases suspected of having myocardial involvement following influenza. An instance of heart block complicating grippé infection in a boy has been reported by Taub (Ill. Med. Jour., June, 1926). The condition disappeared completely after 4 weeks.

In a case of *congenital* complete heart block in a child of 7 months, recorded by R. McIntosh (Amer. Jour. Dis. of Childr., Dec., 1927), the heart was malformed, and its dulness extended 1.5 cm. beyond the left nipple line. The slow rate of 60 to 64 seemed independent of bodily activity. A prolonged systolic murmur, loudest at the apex, was audible throughout the chest. Electrocardiography established the presence of a complete structural block in the bundle of His. Death occurred at 8 months.

Whereas, in complete heart block, vagal control over the auricles is the same as in the normal heart, the vagi have only a slight influence on the

ventricles, according to A. C. de Graff and S. Weiss (Jour. of Clin. Invest., Feb., 1926). On the other hand, the accelerator nerves exert a considerable control over the ventricles in heart block. Exercise in complete block tends to increase the auricular rate but leaves the ventricular rate unchanged. Cheyne-Stokes respiration in complete block may be attended with varying auricular and ventricular responses.

In complete block the idioventricular rhythm, according to Herapath (Lancet, Mar. 27, 1926), may range from 15 to 66 per minute, though usually between 30 and 40. Its regularity may be interrupted by premature ventricular contractions. Sometimes the beats stop temporarily, giving rise to the *Stokes-Adams syndrome*. The reason for these periods of stoppage has remained obscure. In a case studied by the writer, however, repeated electrocardiographic tracings during Stokes-Adams attacks were made, and the following explanation is based on these: In this case attacks of tachycardia precede the periods of ventricular asystole. An irritable focus develops in the right branch of the auriculoventricular bundle; in the early stages this produces occasional premature ventricular contractions, but a little later the irritability increases and the focus produces a simple ventricular tachycardia which displaces the original rhythm. This tachycardia exhausts the rhythmicity of the newly formed pacemaker, and ventricular asystole occurs. After a rest the old site of stimulus production tries to resume activity, but is again disturbed by the new rhythm, which slowly begins a rhythm of its own. After some time

the old rhythm does manage to resume its activity, but it is soon overwhelmed by another attack of tachycardia from the new site of stimulus-production, and so on. The attacks of asystole in the writer's case were abolished by an injection of **adrenalin**. The drug is regarded as having so stimulated the cells of the bundle that the old rhythm is once more made powerful enough to take control. But in a few days this rhythm disappears and the new site of stimulus-production permanently establishes its claim to be the ventricular pacemaker.

In a case reported by P. S. Barker (Amer. Heart Jour., Feb., 1926), response of the auricles to stimulation by the ventricles during complete block was observed. This is explained by retrograde conduction of a mechanical stimulation by the contracting ventricles of the auriculoventricular bundle *above* the lesion causing the block.

**TREATMENT.**—Further favorable reports on **adrenalin** have been appearing. According to G. A. Sutherland (Arch. of Dis. in Childh., Feb., 1926), adrenalin will not only reduce heart block *per se*, but is of great value in the acute rheumatic heart with Stokes-Adams symptoms. In a 17-year old boy in whom rheumatic fever was ushered in by a grave Stokes-Adams attack, 4 minims (0.25 c.c.) of 1:1000 adrenalin solution was given, and from then on there were no more grave symptoms. In all, only 32 minims (2 c.c.) of adrenalin in 5 days were administered. The drug seems to increase the rate of ventricular action by stimulation either of the sympathetic or of the ventricle itself. In a case of Adams-Stokes bradycardia in a man of 26 reported by A. Machado (Brazil-med., June 5,

1926), atropine failed, but improvement promptly took place when **adrenalin**, 30 drops by the mouth daily, was substituted.

In a case recorded by S. A. Levine and M. Matton (Heart, Mar., 1926), **adrenalin chloride** was **injected directly into the heart**. The patient had attacks of Adams-Stokes syncope of several seconds to about 5 minutes duration. In 1 attack no heart beat could be heard or felt for 5 minutes. Under such circumstances, effects from adrenalin given subcutaneously could not be expected, the circulation being at a standstill. During this patient's very long attacks, however, injection of the drug directly into the heart was uniformly followed by prompt recovery. In 1 attack *ventricular fibrillation* lasting 3½ minutes and followed by complete ventricular inactivity for 79 seconds could be demonstrated.

**Ephedrine** has been used successfully by M. Hollingsworth (Cal. and West. Med., June, 1927) in the case of a woman of 68 years who had been averaging 3 Adams-Stokes attacks every 10 minutes. Within 30 minutes after ingestion of ¾ grain (0.05 Gm.) of the drug in a capsule, the attacks stopped, and did not return for 36 hours. Thereafter complete freedom from the attacks was obtained by taking 1 capsule every morning, and the patient was enabled to resume her housework. A trembling sensation in the knees was experienced for the 1st few days only. Later, on discontinuing the drug, the attacks returned in 48 hours, whereupon its ingestion was resumed.

**Barium chloride**, 30 mgm. (½ grain) 4 times daily by the mouth, apparently has a favorable influence

in the prevention of Adams-Stokes attacks, according to S. A. Levine (Trans. Assoc. Amer. Phys.; Jour. Amer. Med. Assoc., June 5, 1926). It is an irritant of the vagus and thus stimulates the heart beat. His routine treatment in Adams-Stokes attacks is to give **adrenalin** every 30 minutes subcutaneously, 8 minims (0.5 c.c.) of the 1:1000 solution. Combination of barium chloride with the adrenalin increases the irritability of the ventricle. P. D. White (*ibid.*) states that one patient was relieved by **barium chloride** for several months, after which it lost its effect; thereupon **adrenalin** was used with good results. F. N. Wilson (*ibid.*) notes failure to revive 2 cases with adrenalin given directly after death from Adams-Stokes disease. In another case, with an attack lasting 55 seconds, the heart was made to beat by **striking the precordium**, and normal rhythm returned. Herrmann and Ashman (Amer. Heart Jour., Feb., 1926) report spectacular results from **barium chloride** in 2 cases of heart block.

Regarding the relationship of heart block to *pregnancy*, Dressler (Wien. Arch. f. inn. Med., Mar. 15, 1927) notes that partial heart block, with even the slightest impairment of conduction, indicates a possibility of widespread myocardial disease, and generally contraindicates pregnancy and, particularly, labor. On the other hand, complete heart block, if severe myocarditis is absent on careful examination, may not have an unfavorable import as to the prognosis of pregnancy.

In a case reported by S. Strauss and J. Meyer (Amer. Heart Jour., Feb., 1928), the lesion responsible for at-

tacks of *transient ventricular standstill* is believed to have been in the ventricle below the bundle of His, possibly at the junction of the Purkinje fibers and the ventricular muscle. The patient died without developing complete heart block. The etiologic factor was evidently associated with a depression of irritability of the ventricle, and the vagus also probably played a part, through stimulation, by way of the gastrointestinal tract. **Adrenalin** subcutaneously did not give permanent relief, and **atropine** failed except in 2 attacks just before death, but **barium chloride**, 40 mgm. ( $\frac{1}{2}$  grain) 3 times daily, yielded complete restoration of normal sinus rhythm for 10 months.

#### PREMATURE CONTRACTION (EXTRASYSTOLE).—

Out of 100 cases of premature contraction analyzed by E. C. White (U. S. Nav. Med. Bull., July, 1927), 30 presented only auricular premature contractions, 51 ventricular, 8 nodal, and 11 multiple foci. Of the entire series, 45 were in cases with definite heart disease and 55 in cases without heart disease. Of the 30 auricular cases, 24 were not associated with cardiac disease, while in the other 6 the cardiac changes were not of a serious nature. Of the 51 ventricular cases, 21 were not associated with cardiac disease, while in the other 30 the heart disease was of more or less serious nature. Of the 8 nodal cases, none were associated with cardiac disease, while of the 11 with multiple foci, 9 were associated with cardiac disease.

From clinical and experimental studies Koppang (Norsk Mag. f. Læg., Mar., 1926) has concluded that extrasystoles may arise either through extravenous irritation or through exaggerated automatic functioning of the subordinate centers. In the 2d



instance, they may well be termed *parasystoles*. Even in the most severe cases of extrasystoles, the writer has witnessed no resulting clinical symptoms other than dizziness.

S. d'Irsay (Amer. Jour. Med. Sci., July, 1927) notes that the significance of extrasystoles remains ill understood. Extrasystoles are not all clinically equivalent, and from scattered experimental facts and some clinical observations he deems of importance a distinction between unifocal and multifocal ventricular extrasystoles. The *unifocal* extrasystoles, arising in a single ventricular focus, are due mainly to disturbances of innervation, while the *multifocal* type, originating in 2 or more ventricular foci, develop on the basis of some organic change which modifies myocardial irritability. Study of 100 cases of extrasystoles encountered at random in an ordinary hospital service, comprising 66 of unifocal and 34 of multifocal extrasystoles, showed that diseases attended with myocardial changes yield a greater percentage of multifocal than of unifocal extrasystoles. Diseases not involving the heart are *not* accompanied by multifocal ventricular extrasystoles. Unifocal extrasystoles sometimes, multifocal extrasystoles **always, are accompanied** by myocardial disease. The prognostic significance of the multifocal type is much the graver, as shown by 44 as against 24 per cent of fatal outcomes during hospital observation of the cases in question. Unifocal extrasystoles may very well be but expressions of extracardial stimulation.

**TREATMENT.**—In a study of the effects of various drugs and other therapeutic agencies on premature

contractions, H. L. Otto and H. Gold (Arch. of Int. Med., Aug., 1926) found that while, in general, rest in bed and atropine had no effect on the number of premature contractions, **quinine, quinidine and digitalis** decreased, and exercise and adrenalin increased, their number. These results seemed to be qualitatively, though not quantitatively, constant, and were unrelated to the type of the extrasystole or to the etiologic, anatomic or functional type of the attendant cardiac disease. H. J. Stewart (Amer. Heart Jour., Aug., 1926) finds **digitalis** in full dosage useful in dispelling spontaneous auricular premature contractions.

In a case reported by Kabakoff (Med.-Biol. Jour., ii, 73, 1926), a severe fright in a young woman caused extrasystoles, which were still present 4 years later and combined with soft pulse, enophthalmos, diminution of all reflexes, and mental depression. Various features of the case pointed to excessive vagus irritability as an important item in the pathogenesis. Under repeated daily injections of 0.0005 Gm. ( $\frac{1}{32}$  grain) of **atropine sulphate** the pulse rate rose from 28 to 72 or higher, the pulse became stronger and more regular, and the general condition improved. Tests with pilocarpine, adrenalin and forced breathing resulted in temporary recurrence of the premature contractions.

According to Pagès and Comte (Bull. Soc. des sci. méd. de Montpellier, Sept., 1927), **marrubium**, administered in the form of an extract, acts favorably in extrasystolic arrhythmia, probably through a cardiotonic effect exerted through the vegetative nervous system. The effects seem comparable to those of quinidine, and there are apparently no contraindications to the use of the drug. The cases most

benefited are those with extrasystoles of digestive origin, but those of ventricular extrasystoles will also respond to the drug.

**ATRIOVENTRICULAR RHYTHMS.**—Normally, the sinoauricular node generates rhythmic impulses at an average rate of 72 per minute. Under certain conditions, however, its work may be undertaken by similar neuromuscular tissue elsewhere, mainly in the auriculoventricular node and bundle. The rhythms arising from these tissues are now commonly called *atrioventricular rhythms*. According to E. N. Chamberlain (Lancet, Dec. 31, 1927), 2 main groups of such rhythms may arise: (1) Paroxysms of tachycardia of atrioventricular nodal origin and single premature beats from the same source called *nodal extrasystoles*. (2) A slow rhythm of the heart due to gradual transference of the pacemaker from the sinoauricular node to the atrioventricular node. The latter is properly called atrioventricular rhythm, though the term *nodal rhythm* is frequently applied to it. Closely allied to atrioventricular rhythm is the condition of *ventricular escape*, in which, during sinoauricular rhythm, occasional beats of the ventricle arise from impulses formed in the junctional tissues.

While atrioventricular rhythm may arise in an apparently normal heart without any obvious cause, it is not uncommonly a feature of some cardiac disability due to disease. Experimentally the rhythm has been produced, on the one hand, by depression of the sinoauricular node, as by cooling with iced water or making incisions around the node, and on the other, by enhancing the function of

the atrioventricular node by warming or electric stimulation. It has also been produced by simultaneous stimulation of the right vagus and left sympathetic. Wilson has produced it in many normal persons with atropine. Deep respiration, digitalis and ether anesthesia are also causes of it, as are likewise such infections as diphtheria, scarlet fever, typhoid, infective endocarditis and rheumatic fever, these infections so damaging the sinoauricular node that its function is temporarily in abeyance.

Atrioventricular rhythm may occur without any symptoms at all, and be discovered accidentally. Vertiginous attacks and palpitations have, however, been reported. Usually bradycardia—45 to 55—is an important feature. The pulse may be regular, but more often shows periods of irregularity resembling the intermissions of partial heart block. Most cases of atrioventricular rhythm are temporary. The rhythm is diagnosed with certainty only by electrocardiograms. In many cases the stimuli pass from the atrioventricular node simultaneously to the auricles and ventricles. According to the position of the P wave in the electrocardiogram 3 types of atrioventricular rhythm may be distinguished: (1) Type I, in which the P R interval is present but shortened, the impulse probably arising in the upper portion of the atrioventricular node. (2) Type II, in which the impulse arises in the middle of the junctional tissues and spreads simultaneously to the auricles and ventricles; the P wave is thus submerged in the QRS complex, sometimes being represented by a notch on the R or S waves. (3) Type III, characterized by an R P in-

terval of varying length, *i.e.*, the P wave occurs after the R wave because the stimulus from the atrioventricular node reaches the ventricle before it reaches the auricle.

Of the conditions to be differentiated from atrioventricular rhythm heart block is the most important, because of the different prognosis, partial heart block being almost invariably a more serious condition. In complete heart block the rate is usually about 30 and regular, while in atrioventricular rhythm it is commonly 45 to 55 and irregular. Partial block may be so similar as to require diagnosis by electrocardiograms or polygrams. The other condition to be differentiated is auricular fibrillation when associated with bradycardia; as a rule the rhythm in fibrillation is more completely irregular.

Generally atrioventricular rhythm calls for no special treatment, unless it is a part of some other cardiac disability requiring attention. For the vertiginous attacks, the use of **atropine** seems rational, as it increases the rate, and these attacks are probably due to excessive slowing of the heart.

Of 2 cases of atrioventricular nodal rhythm reported by T. D. Jones and P. D. White (Amer. Heart Jour., Feb., 1927), one showed merely cardiac enlargement clinically, and had been investigated because of bradycardia, detected when the patient was examined for epigastric difficulties presumed due to esophageal diverticula and nervousness. Atrioventricular rhythm was most constant when the patient was sitting up, but normal rhythm existed on 1 occasion when the record was made in recumbency. Depression of the sinoauricular node was deemed responsible for the abnormal rhythm observed in this case.

#### ARSENIC.—PHYSIOLOGIC

**ACTION.**—The effects of arsenic on tissue nutrition lend interest to researches on the action of this drug on *capillary permeability* and *lymph flow*. W. F. Petersen and T. P. Hughes (Jour. of Pharm. and Exp. Ther., June, 1926) have reported experiments on the lymph vessels which indicate that arsenic does cause changes in the permeability of the capillaries. With small doses there is first produced an increase in permeability apparently involving only water exchange. Later there occurs a diminution which may persist for several hours and probably coincides with the period of water retention observed in arsenic medication. The endothelium is stimulated by Fowler's solution. With small doses the effect is rapidly reversed, while with larger doses the reversal is less apparent and an augmented lymph flow, with increased protein, sugar, phosphates and bile may continue for a considerable time.

Naeslund (Upsala Läk. Förhandl., Mar. 15, 1927) reports experiments in rabbits confirming the view that tolerance to large doses of arsenic following prolonged ingestion of the drug does not imply tolerance when the poison is received parenterally. No property on the part of the liver to bind or detoxicate arsenic reaching it through the portal vein could be demonstrated. Evidently, the increased tolerance is due to diminished absorption of the arsenic from the intestine. A non-specificity relative to acquired arsenic tolerance, already demonstrated by Cloetta in respect of the increased resistance of dogs habituated to arsenic to tartar emetic, was further illustrated by Kuroda (Deut. med. Woch., Feb. 4, 1927), who observed that a dog given by mouth ascending doses of arsenic also acquired tolerance to copper sulphate.

#### UNTOWARD EFFECTS AND POISONING.

—According to B. Throne, L. S. van Dyck, E. Marples and C. N. Myers (N. Y. State Jour. of Med., July 1, 1927), certain *skin diseases* may be in reality due to intoxication by arsenic, chiefly through food contamination or occupational contact. In cases of eczema, scleroderma, leukoderma, psoriasis, Majocchi's disease, pemphigus, motor ocular paralysis and pigmentation these observers found arsenic in

pathologic amounts in the urine. In *eczema* arsenic intoxication seems to be present in about 30 per cent. of all cases. In some cases the skin symptoms appear almost at once after the contact with arsenic; in others the drug seems to be deposited in the skin and to sensitize it, so that later eczema develops upon exposure to a banal irritant. In *scleroderma* the arsenic seems to attack the vegetative nervous system first and later, possibly through this system, the endocrins become affected. In *leukoderma*, arsenic was found deposited in pigmented regions adjoining the depigmented spots, the drug having combined with the sulphur of the melanin. Generalization of *psoriasis* is ascribed by the writers to a retention of arsenic. Cases of generalized psoriasis or psoriasis of the palms should be investigated for arsenic intoxication and treatment calculated to eliminate arsenic given.

A method for the microchemical detection of arsenic in the skin has been described by E. D. Osborne (Arch. of Derm. and Syph., xii, 773, 1925), who applied it in the study of arsenical pigmentation and keratoses. The method consists, briefly, in fixing the tissue in 10 per cent. formaldehyde and, after washing it, transferring it to a neutral hydrogen sulphide solution for some days, then dehydrating, embedding and cutting sections. This results in the formation of arsenic trisulphide, which is recognizable in the tissue as bright yellow crystals. The arsenic was found to be largely, if not entirely, extracellular. It occurred chiefly in the papillae and upper part of the corium, but was also widely distributed through the epidermis. It occurred in small amount about the coil-glands and hair-follicles.

The sensitiveness of the *male genital glands* to arsenic, in common with other poisons, was shown in researches by Kostitch and Verbitzki (C. r. Soc. de biol., Apr. 26, 1927) in rats to which Fowler's solution was administered. Although the rats gained weight and remained in good general condition, pronounced degenerative lesions of the testes, similar to those produced by alcohol or iodine, were found. Gros (Biochem. Zeit., May 12, 1927) found that in rats already afflicted with *avitaminosis* in the form of experimental xerophthalmia and rickets, poisoning by various

arsenicals was more severe than in controls not so afflicted.

The effects of the toxic arsenical gas, arsine, on the *red blood cells* have been studied by Labes (Deut. med. Woch., Dec. 4, 1926). The structure of the red cells was found to be destroyed by a colloidal form of arsenic produced through oxidation of the arsine by the oxyhemoglobin of these cells.

The symptoms and treatment of *arsenical polyneuritis*, as observed in 9 children poisoned by contaminated food or water, are discussed by L. Morquio (Arch. esp. de ped., May, 1926). The patients were all in a hospital for 8 or more months, but ultimately recovered completely under **hot baths, electric treatment, massage** and the administration of **iodides**. In the more acute cases the earlier symptoms had been mainly gastrointestinal, but there was also pronounced melanoderma. The subacute symptoms included symmetrical paralysis and pains in the extremities. Likewise typical was a false Kernig sign, the patients being unable to sit up with their legs extended. The cerebrospinal fluid was normal.

Whatever may be the virtues of **sodium thiosulphate** in the treatment of dermatitis produced by organic arsenicals, H. B. Haag and W. R. Bond (Jour. Amer. Med. Assoc., Apr. 16, 1927) were unable to confirm any value on the part of this drug in the treatment of arsenic poisoning through the mouth. Intravenous or oral use of the thiosulphate neither prevented arsenical death nor delayed the fatal outcome.

**THERAPEUTICS.**—The tendency of arsenic to stir up inflammatory dermatoses of eczematoid type is stressed by M. Scholtz (Cal. and West. Med., Mar., 1927). Its outstanding effect on the skin is the exaggeration and stimulation of all nutritional and functional activities. Its use in chronic eczemas is therefore now abandoned; in psoriasis it is used less than formerly. In acute dermatoses it is considered definitely contraindicated. Throne, Van Dyke, *et al.*, regarding arsenic absorption as a cause of eczema, have treated such cases successfully with intravenous injections of sodium thiosulphate. On the whole, dermatologists now restrict the use of arsenic to certain chronic dermatoses such as **lichen planus** and **dermatitis herpetiformis**.



**ARSPHENAMIN.—PHYSIOLOGIC ACTION.**—The action of arsphenamin on the *heart* has been investigated with the electrocardiograph by W. D. Reid (Jour. Amer. Med. Assoc., Mar. 21, 1925). Records taken in 11 cases 1 hour after injection of the drug revealed a prolongation of the conduction period and a shortening of the refractory phase. These changes, in a heart with impaired metabolic condition, would predispose to the onset of ventricular tachycardia and ventricular fibrillation, the latter a fatal arrhythmia. Many clinicians therefore counsel the restriction of arsphenamin to small doses, or withhold it completely, in patients with heart disease and syphilis.

**ADMINISTRATION.**—Experimental investigation of the efficacy of different routes of administration of arsphenamin in rat-bite fever in rabbits led Watanabe and Abe (Acta derm., Apr., 1927) to the conclusion already generally reached in the clinical treatment of syphilis, *viz.*, that intravenous use gives the best results, while rectal administration is much less effective.

A method of *reactivation of arsphenamin* in the treatment of syphilis has been described by C. N. Myers and J. N. MacGregor (Amer. Jour. of Syph., Oct., 1926), based on the discovery of Throne *et al.*, that arsenic stored up in the body can be released by the use of sodium thiosulphate. Believing that syphilitics who have received several courses of arsphenamin must have their tissues saturated with arsenic, the writers gave sodium thiosulphate intravenously with a view to setting free the arsenic and increasing its therapeutic effect, while at the same time reducing the amount of arsenic stored in the body. The procedure is advocated mainly in certain neurosyphilitic conditions that do not respond to other modes of treatment and in Wassermann-fast cases. In the cases treated, although the serology had become stationary in spite of recognized treatment by arsenic, mercury and bismuth, the reactivation method caused the symptoms present to clear up. A solution of thiosulphate freshly prepared from the crystals must be used. Intravenous injections of  $7\frac{1}{2}$  to 15 grains (0.5 to 1 Gm.) are given twice weekly, and the thiosulphate is also taken by mouth before meals on alternate days.

According to experiments by Schreüs (Arch. f. Derm. u. Syph., July 1, 1926) in mice and rabbits, the aim in arsphenamin administration should be to secure a saturation of the body with the drug. This can be done while keeping the concentration of arsphenamin in the blood low by dividing the total dose into several parts. Clinical study in 73 cases showed the importance of giving regularly at least 10 injections of arsphenamin, along with mercury and bismuth. Improved results are obtainable either by increasing the size of the individual doses, prolonging the treatment, or combining the arsenical drug with substances operating as vehicles.

Somewhat similar views are expressed by C. Voegtlin and H. A. Dyer (Pub. Health Rep., Jan. 21, 1927) on the basis of studies on experimental syphilis in rabbits. The action of arsenicals in syphilis depends wholly on the amount of arsenic injected. The results obtained supported the advisability of intensive treatment, and contradicted the view that such treatment interferes with sterilization on account of an alleged interference with the immunity reaction. Intramuscular injection of sulpharsphenamin is just as effective as the same amount of arsenic in the form of arsphenamin injected intravenously. The index of sterilization, *i.e.*, the ratio of maximal tolerated dose to minimum sterilizing dose, is most favorable with sulpharsphenamin, less so with neoarsphenamin, and least with arsphenamin.

Administration of neoarsphenamin or sulpharsphenamin in a *lactose solution vehicle* is advocated by C. Zuckermann (Medicina, July, 1926) as a preventive of untoward by-effects from the injection of these drugs. Along with 0.15 Gm. of neoarsphenamin 1 c.c. (16 minims) of saturated lactose solution is used; with 0.6 Gm. 2 c.c. (32 minims), and with 0.75 or 0.9 Gm., 3 c.c. (48 minims).

Attempts have been made to diminish the toxicity of arsphenamin injections by the use of *calcium*. According to Schumacher and Liese (Med. Klin., June 18, 1926), reduction of toxicity is due to precipitation of the arsphenamin base by the calcium. Where the blood contains a higher ratio of calcium than normally, this precipitation is accelerated. In applying this principle clinically, the injection of calcium

chloride must precede that of the arsphenamin, otherwise embolism from the precipitate might result. On the other hand, neoarsphenamin, which is less readily precipitable, may be given actually dissolved in calcium chloride solution; the toxic property is, however, not diminished by the calcium to the same extent as with arsphenamin. According to these observers oral use of calcium is also serviceable. E. M. Lewin (Arch. f. Derm. u. Syph., Apr., 1927) disapproves of the giving of neoarsphenamin in a 10 per cent. calcium chloride solution, having observed after such procedure a slight increase of choluria, indicating that the combined solution has an increased toxic action for the liver as compared to neoarsphenamin dissolved in water.

Control of arsphenamin treatment by *liver functional tests* is advocated by H. A. Dixon, W. R. Campbell and M. I. Hanna (Can. Med. Assoc. Jour., May, 1926). Incapacitating illness and at times permanent injury to the liver substance may result from arsphenamin. The van den Bergh serum test was found applicable by the writers in these patients for the determination of latent liver injury. By this test one can detect damage while the patient is still in the stage of latent jaundice.

In mice infected with the spirochetes of *relapsing fever*, Krantz (Münch. med. Woch., Feb. 18, 1927) found the administration of immune serum an effective addition to treatment with neoarsphenamin. Addition of the serum to subtherapeutic doses of the arsenical yielded cures not otherwise obtainable.

**POISONING AND UNTOWARD EFFECTS.**—The peculiar *odor* and *taste* experienced by many patients during intravenous injection of arsphenamin is discussed by J. H. Stokes (Jour. Amer. Med. Assoc., Mar. 20, 1926). A patient who had repeatedly suffered markedly from this annoyance adopted the expedient of allowing a strong **wintergreen** or **clove wafer** to dissolve on the tongue during the injection. Relief was so complete that the writer has made the procedure routine practice, with good results and no unfavorable by-effects. He is unable to say whether the effect is solely that of the volatile essence or partly the result of capturing the attention of nervous patients during an anxious moment.

Attention is called by Szandicz (Wien. klin. Woch., June 24, 1926) to the *hyperemia of the conjunctiva* immediately following arsphenamin injection in persons hypersensitive to the drug. In his patient the hyperemia persisted for about 15 minutes and was confined to 1 eye. Another evidence of arsphenamin intolerance he has noted consists of persistent *pains in the joints*.

In a case of inherited syphilis in a young girl of 18 years, reported by Carrera (Prensa med. argent., May 10, 1926), a course of neoarsphenamin, up to a total of 4.5 Gm., was followed by a severe *skin eruption* together with violent *stomatitis* and *gingivitis*, extensive edema of the tongue and inner aspects of the cheeks, and ulcerations. Gradual subsidence of the lesions took place in 2 months under the local use of **hydrogen dioxide creams** and **adrenalin** taken by the mouth.

Jeanselme, E. Schumann and L. Popoff (Ann. de dermat. et syph., June, 1926) report a case of marked *pigmentation* and *keratoderma* following neoarsphenamin treatment of a pregnant woman for suspected syphilis. Erythema of the face, neck, body and thighs appeared on the day after her delivery, and was followed by keratosis and then bronzed discoloration over the neck and shoulders. Involvement of the skin follicles was shown by histologic examination. Alopecia was pronounced, and there was destruction of the hair bulbs, papillae and of the sebaceous glands.

Development of a *fibrosarcomatous tumor* in the left interscapular region at the site of an injection of arsphenamin 15 years previously is reported by H. F. Harbitz (Lancet, Jan. 8, 1927). Its neoplastic character was indicated by progressive growth, appearance, limitation by a capsule, and microscopic picture with scanty infiltration of leukocytes. Small amounts of arsenic were found in the tumor.

In a tabetic who had received 3 series of intramuscular injections of sulpharsphenamin, P. Emile-Weil and Isch-Wall (Bull. Soc. méd. des hôp. de Paris, Mar. 17, 1927) witnessed the development of a severe *anemia*. Whether such anemias are caused by the benzene ring or the sulphur of the arsenical compound is not as yet known. **Blood transfusions** brought about recovery

from the anemia in this and 2 other like cases.

In general, arsenic compounds are well tolerated by children. K. Dodd and S. J. Wilkinson (Jour. Amer. Med. Assoc., Mar. 3, 1928) report, however, a fatal case of arsenic poisoning in a congenitally syphilitic child of 11 years. She had received intravenously 0.3 Gm. of sulpharsphenamin, and at weekly intervals thereafter, 0.4, 0.4, and 0.45 Gm. After the last injection she said she had been in bed for the last few days and her side hurt. The liver was found large and tender, with general glandular enlargement and a grayish throat exudate. Upon admission to the hospital, her blood showed only 4450 white cells. Five days later the temperature rose to 105° F. and the throat became intensely red and painful. In the blood smear the *polymorphonuclear cells* had entirely *disappeared*. Throat cultures consistently showed only staphylococci. By the 8th day the white count had dropped to 2350 and on the 9th, when the child died, only 8 white cells could be seen in the whole counting chamber. Autopsy showed enlarged liver, bronchopneumonia, and almost complete *aplasia of the bone marrow*, affecting especially the myeloblastic cells.

The arsenic had evidently produced the aplasia of the blood-forming elements, and no leukocytic resistance could be offered to the secondary infection.

Reports of 22 cases in adults showing similar reactions to the arsphenamins were found, but none in children. In all of these cases but 2, there was marked reduction of white cells with reduction or disappearance of polymorphonuclears. Fourteen cases were fatal. Blood transfusion gave no apparent benefit. Eleven had severe stomatitis with sore throat. There is a striking similarity of such blood reactions to that produced by chronic benzene poisoning. The arsphenamins contain a double benzene ring but it has never been proved that they ever break down into benzene in the body. Some few patients react to the arsphenamins, or perhaps only to 1 brand, as all persons react to benzene. Attention should be paid to apparently slight blood reactions following earlier treatments. Sodium thiosulphate might be tried for therapeutic purposes.

Discussing *fatalities* following arsphenamin, E. Scott and R. A. Moore (Jour. of Lab. and Clin. Med., Jan., 1928) note that hemorrhagic encephalitis is the most important effect of the drug on the nervous system. Early and late jaundice may occur, and acute yellow atrophy supervene on the latter. Exfoliative dermatitis may be complicated with bronchopneumonia or septicemia and end fatally. Hemorrhagic nephritis, ulcerative enteritis and aplastic anemia occur rarely. The essential pathologic findings in death from arsenical poisoning comprise endothelial destruction resulting in congestion and hemorrhage in most organs of the body; poor circulation resulting in edema of the brain and lungs; nephritis, usually tubular, but also sometimes glomerular in type; sometimes infarcted and necrotic areas in various viscera; necrosis of the liver and sometimes acute yellow atrophy. To prevent fatalities: (1) Avoid the drug where kidney examination shows that the organ already has difficulty in eliminating the ordinary metabolic wastes. (2) No considerable quantity of mercury should be given along with or shortly after arsenical treatment. (3) The best care and technic in administration is necessary, *viz.*, the use of sterile, freshly distilled water; complete neutralization of arsphenamin, sufficient volume; fairly slow injection; not too heavy a dosage at first or if any intolerance is observed.

**Sodium thiosulphate** has been used, among others, by K. Ullmann (Derm. Woch., Jan. 2, 1926) in the treatment of the toxic effects of arsphenamin. He witnessed marked benefit from it in many cases of slight or moderately severe arsenical poisoning and in 4 cases of late jaundice after neoarsphenamin or neosilver arsphenamin. The drug may also be used prophylactically and for local detoxication. It is regarded as having a precipitant action on arsenic salts, breaking down the metallic radicals and thus attracting and detoxicating them. It is almost non-toxic up to 30-grain (2-Gm.) doses given in concentrated—20 or 25 per cent.—solutions intramuscularly or intravenously, or when given by mouth in doses of 15 grains (1 Gm.) several times daily.

**ARSPHENAMIN DERIVATIVES AND ALLIES.**—Sulpharsphenamin.—

Among further reports on this compound

is that of Fox (Amer. Jour. of Syph., ix, 436, 1925), who gave it intramuscularly or subcutaneously in 33 per cent. solution in doses as high as 0.6 Gm., with a local reaction only in occasional instances. In relation to systemic toxic reactions, intramuscular injection proved to be the method of choice. In the secondary stage of syphilis the drug had a slower healing effect on cutaneous and mucous lesions than is usual with other arsphenamins given intravenously, but the ultimate results as judged by absence of recurrence and the serum reaction compared favorably with those from other arsenicals.

No superiority for the drug was shown in neurosyphilis, Wassermann-fast cases, or cardiovascular syphilitic disease, but it was found useful in treating 3 patients who had previously developed nitritoid reactions after intravenous injections of the other arsphenamins.

According to M. F. Lautman (Arch. of Derm. and Syph., Feb., 1926), sulpharsphenamin given intravenously does not produce dermatitis and causes practically no constitutional reactions. Patients submit more willingly to its use, and it is therefore indicated in cases in which the maximum spirocheticidal effect of arsphenamin and neoarsphenamin is not essential. In cases that are Wassermann-negative and free of clinical symptoms the drug seems quite as capable of controlling the disease as the older compounds.

After giving almost 4000 injections of sulpharsphenamin, F. C. Combes, Jr. (Arch. of Derm. and Syph., Feb., 1927) has witnessed a case of *purpura hemorrhagica* following treatment in a man of 54 with early tabes. The first hemorrhages appeared about 10 weeks after the first injection of the drug and 2 weeks after the last injection. There were many confluent hemorrhages, most numerous about the lower leg and ankles. There were also boring pains in the ankles, and later, bloody stools and bleeding from the gums. In spite of 2 blood transfusions, the patient soon succumbed. The blood indicated an acute interference with the production of polymorphonuclears, basophiles, eosinophiles and platelets. Such a hematopoietic crisis cannot be anticipated, and the only possibility of averting death lies in early recog-

nition of the condition and treatment by blood transfusion.

**Stovarsol (Acetarson; Acetylarsan; Spirocid).**—This compound, chemically acetyloxyaminophenylarsenic acid, and containing 27 per cent. of arsenic, was first prepared by Ehrlich, but not used in syphilis until 1922, when Levaditi and his co-workers introduced its clinical use in a purified form. In this country, it was admitted to N. N. R. in 1926 as a remedy against **amebiasis**, but not recommended in syphilis. It has also been administered in **giardiasis**, **yaws**, **malaria** and in **chronic malnutrition** for its general tonic effect.

The drug is given by mouth. Levaditi and others introduced its use in the form of tablets each containing 0.25 Gm. ( $3\frac{3}{4}$  grains). Four tablets may be given every morning in a little water before breakfast in periods of 5 to 7 days, followed by intervals of the same length. A total dose of 12 to 16 Gm. (3 to 4 drams) may thus be given in the first month. Fournier and his co-workers look upon stovarsol by the mouth as sufficiently active in syphilis to be used as an "attack" remedy either alone or in conjunction with another specific, such as bismuth, in cases where, for any reason, intravenous or hypodermic injections of other antisyphilitic drugs are impracticable.

P. Beutl (Derm. Woch., Apr. 8, 1925) found that 4 out of 6 chancres began to heal after a few days' medication with stovarsol; after 2 or 3 days, no spirochetes were demonstrable. Secondary syphilitics receiving 16 to 25 Gm. (4 to  $6\frac{1}{4}$  drams) of stovarsol showed a negative Wassermann reaction 2 to 3 months after the end of the course, but the reaction usually became positive later. In 2 patients with untreated gummas of the skin and positive Wassermanns, the lesions had healed after 20 Gm. (5 drams) of stovarsol, leaving superficial pigmented scars, but the Wassermann was still positive after 4 months. The drug was uniformly well tolerated.

Using 1 tablet (0.25 Gm.) of stovarsol per kilo. (2.2 pounds) of body weight as a course, F. W. Cregor and F. M. Gastineau (Arch. of Derm. and Syph., Jan., 1927) used stovarsol in **syphilis**, with favorable results. From 10 to 12 tablets, divided in equal dosage, were given through a period of 4 days, 3 days being then allowed for



elimination. The entire course took 5 to 6 weeks, totalling 15 Gm. ( $3\frac{3}{4}$  drams) of stovarsol on an average. The infection seemed aborted in primary cases. In secondary and tertiary cases, symptoms were promptly controlled, and serologic improvement was noted. All patients had a feeling of well-being while under the treatment, and they generally gained in weight and vitality, notably in the severe rupial type and in latent cases. Only 1 case, of a severe rupial type, was resistant to the drug. Reactions consisted of mild headache, slight fever and a metallic taste. Tolerance of stovarsol is high when compared to that of other arsenicals. Its efficiency is comparable to that of neoarsphenamin and it has a place in the treatment of syphilis, although its precise dosage has yet to be determined. Being effective by the mouth, it should be of great prophylactic value against syphilis. When it is taken therapeutically, the usual course of mercury or bismuth by intramuscular injection should follow its use.

Characteristics of stovarsol (Editorial, Brit. Med. Jour., Jan., 1927) are that it is absorbed rapidly, of low toxicity, and quickly excreted in the urine. It is stated never to have caused optic neuritis. Laurent, having used acetylarsan extensively for over 3 years, has reported favorably on its action as an antisiphilitic, and found it especially useful in congenital syphilis in infants, because it could be injected hypodermically without producing irritation. According to Levaditi, however, it is more active if given by the mouth than when injected.

According to W. L. Bender (Amer. Jour. Med. Sci., Dec., 1927), toxic reactions from stovarsol are of sufficient frequency and severity to be borne in mind when it is prescribed. Mention of undesirable effects is present in nearly every report of its use in series of 10 or more cases, including 1 or several of the following: Coryza, bronchitis, sore throat, malaise, aching, chill, fever, skin eruption, jaundice, adenitis, diarrhea, abdominal pain, eosinophilia and albuminuria. The 6 cases of stovarsol poisoning seen by the writer followed a rather constant course, beginning with a day or 2 of coryza or sore throat with malaise and muscular aching, and usually fever, rising

with the appearance of the rash and falling as it fades. Adenitis, especially in the neck, and the eruption are sometimes the first symptoms. The rash tends to be generalized, is erythematous with at times purplish areas, and may be macular or papular, fine or coarse, and resembling either scarlet fever or measles; there may be urticarial characteristics and much itching. In 4 cases with blood counts, there was a leukopenia of 3250 to 5200. No serious cases were encountered, and recovery was usually complete in 1 to 2 weeks. Several cases of persistent exfoliative dermatitis have, however, been reported. Toxic symptoms have been noted most frequently after stovarsol had been taken for several days, usually from 6 to 14, and after an average total dose of 96 grains (6 Gm.). In most instances prompt discontinuation suffices to avoid serious poisoning. **Sodium thiosulphate** has at times been administered. Stovarsol cannot be considered safe in cases where arsphenamin has already proven toxic.

**Tryparsamide.**—Further clinical reports on this agent include that of P. A. O'Leary and S. W. Becker (Med. Jour. and Rec., Mar. 3, 1926), who employed it in 207 cases, and deem it of value in the parietic type of parenchymatous neurosyphilis. It seems less effective than malarial treatment, but is available for cases not suited to the risks of the latter treatment. There is a certain small group of patients with early paresis who derive marked benefit from it. In 7 cases there was a complete reversal of the spinal fluid findings to normal, but without associated clinical improvement. Objective visual complications, encountered in 4.3 per cent. of the cases, constitute a hazard which could not be obviated by special precautions. Combination of bismuth intramuscularly with tryparsamide seems to offer better therapeutic results than either drug alone.

J. D. Silverston (Lancet, Oct. 2, 1926) reports on 8 cases of **general paralysis** treated with tryparsamide. Of these, 2, which were early cases, showed complete remission, and in 1 of these, after 20 injections, the blood and spinal Wassermanns became negative and the colloidal gold reaction became normal. Of 7 other cases treated with tryparsamide after receiving malarial treatment, 2 early cases showed

complete clinical remission and 1 more advanced case improved. Serologic improvement in varying degrees was manifested in all the cases of general paralysis receiving tryparsamide, and the effect on the cell count was particularly striking, the number of lymphocytes in the spinal fluid being markedly reduced. Neither the clinical nor the serologic results of combined treatment were, however, considered by the writer any better than those obtained with malaria alone. The drug, whenever possible, was given intravenously in weekly doses of 3 Gm. over a period of 8 or 10 weeks. The dose was dissolved in 10 c.c. (162 minims) of sterile freshly distilled water. Eight or 10 injections of tryparsamide combined with mercury salicylate, 1 grain (0.06 Gm.) intramuscularly, comprised a single course. Two or 3 courses, with rest intervals of 6 to 10 weeks, were given. A striking feature of tryparsamide therapy was the marked improvement in general health and increase of body weight recorded in the majority of cases.

According to M. Brown and A. R. Martin (*ibid.*), prolonged administration of tryparsamide in **general paralysis** is at least worthy of trial, particularly in the megalomaniac forms. It is a drug of low toxicity, readily soluble, and very easy to administer. That it has penetrating power is indicated by the remarkable results obtained in trypanosomiasis. Out of 13 cases of neurosyphilis treated under laboratory control by the writers, all but 2 benefited in some degree. Five steady workers were able to return to their homes. Three cases previously unemployable and inclined to be dull, listless and foolish became willing workers. Two bed cases recovered sufficiently to be up and do light ward work. There were no toxic effects, and all but 2 patients gained weight.

**Myosalvarsan (Myoarsphenamin).**—This preparation is stated by W. Kolle (Deut. med. Woch., Mar., 1927) to have been developed by chemical treatment of formaldehyde sulphite arsphenamin, and to possess the same chemotherapeutic index as neoarsphenamin. It is peculiar in being well suited for subcutaneous or intramuscular injection. Used intramuscularly in syphilitic patients, it caused no local reaction, pain nor infiltration, and was absorbed in a

few days, without rest of the part. The preparation is not intended to replace the intravenous injection of arsphenamin or neoarsphenamin, but to be used under special circumstances.

**Bismuth Arsphenamin Sulphonate.**—As described by J. H. Stokes and S. O. Chambers (Jour. Amer. Med. Assoc., Oct. 29, 1927), this agent, produced by G. W. Raiziss, is valuable in combining adequate spirillicidal with defense-arousing properties and in being extremely soluble and thus administrable in a small amount of water. Its arsenic content ranges from 12 to 15 per cent. and its bismuth content, from 23 to 25 per cent. Its toxicity compares favorably with the well-known arsphenamin derivatives, but it cannot be used intravenously on account of the bismuth. It has high spirocheticidal activity in rabbits, being practically equivalent to arsphenamin. The writers have given 4118 injections of it to 204 patients. It is administered intramuscularly in 0.2-Gm. doses, dissolved in ampules in 1 c.c. (16 minims) of sterile distilled water, forming a brown solution, to which is added 2 minims (0.12 c.c.) of 2 per cent. butyn solution as local anesthetic. The injection should be epifascial, and preferably at the inner angle of the upper outer quadrant of the buttock. The initial dose is 0.1 Gm. for the physically sound adult. Children over 5 years tolerate adult dosage well. The local reaction is generally mild. Slight stinging pain may be felt at the moment of injection. Slight stiffness and tenderness in the majority, with slight swelling and heat in 20 per cent. of the patients, may be noted, not in excess of what follows other forms of bismuth injection. A hot sitz-bath each evening is helpful. Infiltrations are uncommon. Only 1 abscess, in a very obese woman, occurred in 4200 injections. Two injections a week are best for all patients in good general condition or for intensive effects. The course comprises 20 to 40 injections.

The drug is deemed advantageous in being a water-soluble compound of bismuth, quickly absorbed and free from cumulative effects. Its ultimate effect in early syphilis appears to equal or exceed that of intensive combined treatments with other drugs. The ultimate proportion of serologic reversal and negative spinal fluids—all cases in

both instances—is unusual. The toxicity of the drug is very low, and it is a useful alternate where other arsphenamins have produced cutaneous or hepatic reaction. Nitritoid crises, occurring occasionally, are controllable and preventable. Bismuth mouth symptoms are rare. Most patients experience tonic effects. The drug has made an excellent record in cardiovascular syphilis, and in Wassermann-fast syphilis its effect is good.

**ARTERIES.—INFLAMMATION.**—As regards acute arteritis, Gray (Jour. of Path. and Bact., July, 1926) has reported a case of *polyarterial acuta nodosa* in a boy of 12 years who developed sepsis of the thigh 9 weeks after a scratch on the knee. After 9 weeks of illness he died suddenly, and the autopsy showed rupture into the peritoneal cavity of a saccular aneurism of the cystic artery. There were many aneurismal dilatations in other parts of the body and marked changes in the intrahepatic branches of the hepatic artery, the smaller branches of the renal arteries and the coronary arteries. The latter appeared as tortuous white cords, with bluish thrombus-filled spherical nodules here and there along their course. A blood culture in this case had given a growth of *Staphylococcus albus* only.

According to Schlaepfer (Arch. of Int. Med., Apr., 1926) chronic and acute arteritis of the *pulmonary artery* and of the patent ductus arteriosus have been encountered in 19 cases. The anterior wall of the artery and the pulmonary orifice of the duct are the places of predilection. In all 19 cases the picture was that of a sub-acute bacterial endocarditis, along with the signs of a patent ductus arteriosus.

Most of the recent literature on

arteritis has dealt with *arteritis obliterans*, *endarteritis obliterans*, or Buerger's disease [the latter specifically considered under a separate heading, *q. v.*]. Lian, Puech and Viau (Bull. Soc. méd. des hôp. de Paris, May 5, 1927) find that in arteritis obliterans with *intermittent claudication* nutritional disturbances occurring about the age of 50 are an important causal factor. Tobacco plays a considerable rôle, syphilis a significant one. A chronic infection, diabetes or gout constitute uncommon causes. These writers regard Buerger's disease as a mere clinical form of arteritis obliterans and not a pathologic entity.

The relative frequency of incomplete arteritis obliterans of the *subclavian artery* is stressed by Lian, Gilbert-Dreyfus and Puech (Bull. Soc. méd. des hôp. de Paris, July 28, 1927), who record 8 such cases. Systematic auscultation in the supraclavicular spaces will reveal this condition, which gives rise to a systolic murmur audible in this space. Such auscultation should be carried out in all patients presenting even a slight murmur at the base of the heart, as well as in cases presenting an inequality of the pulse or systolic pressure in the upper extremities. The detection of incomplete arteritis obliterans of the subclavian may lead to the discovery of syphilitic infection in the patient.

Yacoël and Boyer (Bull. de l'Acad. de méd., Mar. 29, 1927) report a case of non-diabetic arteritis obliterans in a man of 36 in which daily injections of 15 units of **insulin** caused rapid disappearance of the pain and enabled the patient to walk and resume his usual occupation. Increased

permeability of the arteries as a result of the treatment was indicated by a gradual rise in the oscillometric index. The benefit from insulin is explained on the basis of disorder of the pancreas and other endocrine glands as the origin of the arteritis obliterans. In a later report, Vaquez and Yacoël (Presse méd., May 18, 1927) state that pain was reduced or relieved by insulin in 4 out of 40 cases of non-diabetic arteritis obliterans. The treatment consisted in courses of daily injections of 10, 15 or 20 units of insulin for 20 days, with rest intervals of 10 days between courses, this procedure being kept up for some months or a year. A **diet rich in carbohydrates** is simultaneously prescribed.

In a case of *atheromatous senile arteritis* with severe pain, H. Gaudier (Écho méd. du nord, Oct. 22, 1927) resorted to **periarterial sympathectomy** of the femoral artery, the neural sheath of which was removed over a distance of 4 cm. (1½ in.). Cessation of pain promptly occurred, ulcerations healed, and the result was still maintained 4 months later.

An *edematous type of arteritis* in the lower extremities is described by Harvier and Lemaire (Bull. Soc. méd. des hôp. de Paris, Apr. 7, 1927), who encountered 2 such cases. In each case the edema was unilateral and attended with an elevation of local temperature.

In 1 reported patient, for a year previous to the edema, there had been copious sweating of both legs. This and other evidences suggested a disturbance of the sympathetic, possibly associated with irritation of the sheath of the artery and enhanced by walking and fatigue.

**INJURIES.**—A case of *stab wound* at the bifurcation of the *common carotid and subclavian*, involving both vessels, is reported by O. Orth (Zent. f. Chir., Feb. 12, 1927). The patient was operated on within 10 minutes after the injury, without anesthesia. The wound was supraclavicular in location. The sternomastoid and scalenus anticus muscles having been severed, the clavicle was divided and its ends retracted. The only ligation possible being of the innominate, the writer closed the opening with 7 sutures of silk and superimposed a flap of muscle for further safety. Recovery followed, with some remaining weakness and paresthesia of the extremity.

**LIGATION.**—Ligation of the vein proximal to the site of ligation of a large artery is advocated by E. Holman and M. E. Edwards (Jour. Amer. Med. Assoc., Mar. 19, 1927) as a new principle in vascular surgery. The ligation of the vein should be proximal to the venous tributaries that accompany the arterial branches furnishing the main collateral circulation. Such ligation is advantageous in producing an increased peripheral resistance in the capillary bed normally supplied by these arterial branches, and directs the blood flowing through these branches into channels anastomosing with the more distant arterial vessels. When a vein and artery are simultaneously ligated, if signs of impending gangrene in the limb should appear, ligation of the vein at a considerable distance proximal to the artery is indicated. Thus, after ligation of the popliteal artery and vein, if gangrene impends, the common femoral or common iliac vein should be ligated. In thrombo-



angiitis and endarteritis obliterans, ligation of the main vein is advantageous, tending to restore balance between the arterial and venous systems in the limb and thereby in some instances averting gangrene. Holman (Ann. of Surg., Feb., 1927) reports a case of ligation of the *innominate artery* for varicose aneurism of the subclavian vessels. One year after the operation the condition was gratifying and still improving, and it seemed probable that the aneurism had been permanently cured. In ligation of a large arterial trunk the writer prefers a coarse ligature such as a **broad tape** rather than fine ligatures. The ligature should be tied so as to occlude the artery without crushing it.

In experimental work in dogs, J. S. Horsley (Jour. Amer. Med. Assoc., Oct. 17, 1925) met with several instances of reestablishment of the lumen following ligation in continuity of a large artery. To insure permanent occlusion of a large channel, it is best to apply 2 or more ligatures and sever the artery between, allowing the ends of the artery to retract. In large vessels it is better to apply 3 ligatures and divide the vessel between the 2 distal ones. The proximal ligature takes up the impulse of the heart beat and allows the tissue within the distal ligature to heal at rest.

In view of the increasing difficulty of obtaining kangaroo tendon for ligature, Sir Charles Ballance (Lancet, July 3, 1926) advocates the use of *ox peritoneum ligatures*, which resist absorption somewhat longer than kangaroo tendon or catgut, present many good qualities, and constitute the purest white fibrous tissue in the body. A chromicized ox peritoneum ligature, made from broad strips of membrane,

seems perfect for ligation of a large artery in continuity or for the radical cure of hernia.

*Hemostasis without suture* is a principle brought out by G. E. Ward (Med. Jour. and Rec., Nov. 17, 1926) in the surgical use of high frequency currents. Where, in electrocoagulation, large vessels are opened, the procedure consists in simply applying hemostats, and then closing the vessels, not by ligation, but by coagulation through contact of the electrode with each of the hemostats in turn.

**TRANSPLANTATION.**—Out of 51 transplantations of vessels for war wounds necessitating excision of a portion of vessel too long to permit of repair by end-to-end suture, R. Weglowski (Zent. f. Chir., Oct. 3, 1925) obtained excellent results in 47, 3 deaths occurring from secondary hemorrhage and 1 case requiring amputation for gangrene. The arteries involved comprised: Femoral, 30; popliteal, 9; subclavian, 5; axillary, 4, and external iliac, 3. Transplants from a vein were used, generally taken from the internal saphenous, occasionally from the cephalic or others. The veins in the injured limb being dilated, as a rule, a vein from this limb should be selected. Paraffined silk is used, and the peripheral end of the vein 1st joined to the proximal end of the artery. In all of the 47 cases excellent function was restored, and in 40 of these, pulsation in the distal part of the limb was plainly manifest.

**ARTERIOSCLEROSIS.**—A contrast is established by V. Mladjovsky (Schweiz. med. Woch., Oct. 9, 1916) between those cases of arteriosclerosis which develop with hypertension

and those exhibiting symptoms other than high blood-pressure. Presclerotic hypertension is generally associated with disturbance of the vegetative nervous system, and may exist for years without being suspected. In obese and gouty cases, traces of albumin frequently occur. Among noteworthy early symptoms are local vascular spasms such as neurospastic angina pectoris, disturbed heart rhythm, intermittent claudication, and digestive disturbances such as sensations of fulness, meteorism, constipation and pylorospasm. Dizziness, headache, tinnitus and mental depression are among the early cerebral symptoms. Slight glycosuria and lowered sugar threshold may coexist.

In the 2d group, cerebral hemorrhage may occur in the absence of previous clinical symptoms and with gradually oncoming symptoms of arteriosclerosis. Circulatory disturbances in the limbs, *e.g.*, paresthesias, generally nocturnal, may be met with. Cerebral and digestive symptoms are also common. The writer considers this group likewise closely related to the sympathetic and parasympathetic systems and the endocrins. Reduced activity of the thyroid appears to attend or initiate arteriosclerosis. Preëxisting hyperthyroidism may wane as arteriosclerosis sets in.

T. Howard (L. I. Med. Jour., July, 1926), in comparing arteriosclerosis with and without high blood-pressure on the basis of 150 private patients, finds that with certain exceptions the symptoms and complications of the 2 groups are remarkably similar. The cerebral accidents, in particular, seemed to depend more on the condition of the vessel than upon the presence or

absence of chronic hypertension. The patients with hypertension, however, were more prone to circulatory failure than those with normal blood-pressure. Angina pectoris was more frequent in those with normal than those with high pressure, whereas headache was encountered 3 times more often in those with high pressure. Non-hypertensive arteriosclerosis sufficient to cause symptoms occurred as early in life as arteriosclerosis with hypertension. Obesity was most often associated with the hypertensive type.

In 256 cases of arteriosclerosis analyzed with regard to *localization* by Hesse (Frankf. Zeit. f. Path., xxxv, 477, 1927), the following incidences were found: Generalized arteriosclerosis, 96; arteriosclerosis of the brain, 98; renal vessels, 39; heart, 23. As to the distribution in *cerebral arteriosclerosis*, M. Kodama (Zeit. f. d. ges. Neurol. u. Psych., cii, 597, 1926), in a study of 18 cases, found arteriosclerosis in the brain-stem more common than that in the cerebral hemispheres, although involvement of the entire cerebrum proved more common than of any single portion. Of the basal ganglia, the putamen of the lenticular nucleus was the most commonly affected part, next the caudate nucleus, and then the pallidum. In the cerebral hemispheres, arteriosclerosis was more common in the white substance than in the cortex.

The incidence of *retinal arteriosclerosis* in 47 diabetics, with and without hypertension, has been studied by Altnow (Arch. of Int. Med., Dec., 1927). With hypertension the condition was found in 81.8 per cent., as against 36.1 per cent. in the cases without hypertension. A similar

study was made in 56 patients in whom chronic myocarditis was either the primary or the important secondary diagnosis. With hypertension, retinal arteriosclerosis was present in 91.2 per cent., and without it, in 68.2 per cent. In chronic valvular disease on a rheumatic basis, retinal arteriosclerosis existed only in  $\frac{1}{3}$  of the cases, and when present, coexisted with hypertension and occurred in patients of an age frequently attended with vascular degeneration.

Attention is called by Ortner (Med. Klin., Apr. 9, 1926) to a particular result following compression of 1 or both femoral arteries in arteriosclerosis, *viz.*, a bradycardia beginning 2 to 4 cardiac contractions after the compression.

#### ETIOLOGY AND PATHOLOGY.

—Another research on the relationship of *protein diet* to arteriosclerosis has been reported by F. R. Nuzum, B. Seegal, R. Garland and M. Osborne (Arch. of Int. Med., June, 1926). Excessive protein diets being fed to experimental animals for periods as long as 2 years, increased blood-pressures were obtained. The animals with the most pronounced increase showed extensive arteriosclerosis of the aorta and frequently of the coronary arteries. Chemical studies of the blood and urine also afforded evidence of renal injury. Increased blood-pressure and arteriosclerosis can be produced without an increase of cholesterol in the diet.

Other observers are more disposed to stress the significance of cholesterol in the morbid process. S. Shapiro (Jour. of Exp. Med., Apr., 1927) records experimental work indicating that alimentary hypercholesterolemia acting 110 days or longer

in rabbits results in deposition of cholesterol within the intima of the aorta, and asserts that this cholesterol deposition initiates the formation of experimental atheromas. Whereas sublethal suprarenal insufficiency did not increase the susceptibility of rabbits to the development of such atheromas, thyroidectomy, splenectomy and gonadectomy were observed to augment hypercholesterolemia and thereby facilitate and accelerate the development of the atheromas of the aorta in rabbits.

Analogously, K. Löwenthal (Med. Klin., May 14, 1926) was able to produce arteriosclerosis in omnivorous animals by feeding with cholesterol in oil in conjunction with large quantities of proteins or after castration. Arteriosclerosis may be induced in rabbits by cholesterol even without augmenting very materially the amount of cholesterol in the blood. In young individuals with lipoid nephrosis and lipemia the writer detected arteriosclerotic changes.

According to A. Faber (Ugeskr. f. Læger, May 6, 1926), arteriosclerotic changes identical with those of man can be induced in animals with small doses of *adrenalin*, *bacterial toxins* and food rich in *cholesterol*. Starting early in life and then gradually progressing, the process may be described as a benign proliferative and degenerative change. At times, however, superadded external factors hasten the course of the disease. Stress is laid on *diet* adjustment as a prophylactic measure.

C. Funck (Arch. f. Verd., Nov., 1926) connects the disorder of cholesterol metabolism with pathologic changes causing products of protein cleavage to circulate in the blood,

such products, in turn, leading to high blood-pressure and arteriosclerosis through the medium of *allergy*. Elsewhere (Med. Jour. and Rec., Oct. 6, 1926), this observer advocates *animasa* as a "causal" treatment of arteriosclerosis.

That local *arterial anemia* may be a direct cause of atheromatous degeneration is maintained by V. H. Moon (Arch. of Path. and Lab. Med., Mar., 1927). It can be mathematically shown that arterial hypertension causes local anemia in the artery wall, and this explanation harmonizes with many facts relative to the occurrence and course of atheroma.

According to J. Bordley, 3d, and B. M. Baker, Jr. (Bull. Johns Hopk. Hosp., Apr., 1926), there exists an association between arteriosclerosis of the vessels supplying the brain-stem and persistent high blood-pressure. It has long been recognized that arterial hypertension is accompanied by arteriosclerosis in at least some portion of the body. There might well be in hypertensive cardiovascular disease a localization of the arteriosclerotic changes in the region of the vasomotor center. These changes, lowering the blood-supply to this center, would be followed by a compensatory increase in arterial tension. In an examination of 24 cases, the writers found that in the brain-stems with marked arteriosclerotic change there was also a clinical history of high blood-pressure, whereas in the majority of cases in which sclerosis of the vessels of the medulla oblongata was slight or negative, the blood-pressure was low and there was little evidence of nephritis. Changes in the medulla may, to be sure, be secondary to hypertension.

**TREATMENT.**—Little has appeared on this subject of late. Mladějovsky (*loc. cit.*) summarizes as the general therapeutic measures indicated **elimination of noxa, improvement of the blood circulation and of physicochemical conditions, endocrin treatment and treatment of the heart.** The capillary circulation, in particular, should be improved. **Balneotherapy** is of marked service. Aside from the withdrawal of tobacco, alcohol, etc., attention should be given to the intestinal tract. Any known metabolic disorders present should be suitably treated. Excess of exercise should be avoided. **Massage** is of value, and the **high frequency currents** may be availed of. **Sodium silicate** taken by the mouth is of service, and organotherapy, especially **thyroid** and the **gonads** yields good effects, particularly in cases at the climacteric age.

According to M. A. Mortensen (Jour. Amer. Med. Assoc., Nov. 28, 1925), study of family histories plainly shows that arteriosclerosis or cardiovascular-renal disease is hereditary, as is also an abnormality of protein metabolism manifested by an increase of the uric acid in the blood. This abnormality, occurring long before any evidence of high blood-pressure or renal disease exists, may be of endocrin origin, or due to malfunctioning of the hepatic cells. A **basic diet**, necessitating a reasonably **low intake of proteins**, constitutes a rational mode of both prophylaxis and treatment.

**ARTHRITIS.—A. ACUTE ARTHRITIS.—ETIOLOGY.**—It is now generally agreed, as stated by E. H. Kettle (Lancet, June 4, 1927),

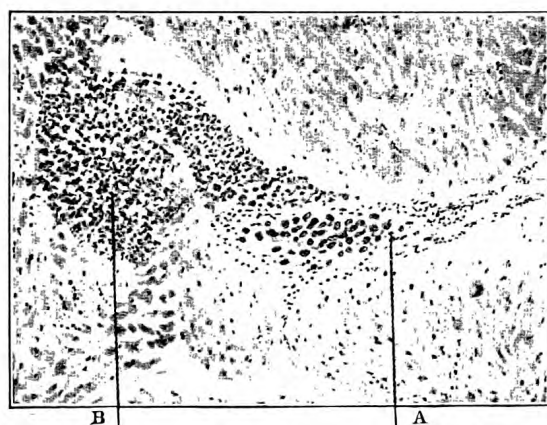


that the Aschoff node is the essential lesion of *acute rheumatism*. The nodes are multiple and consist in the acute stage of aggregations of large cells of the endothelial type, some of which may be multinucleated, and mononuclear wandering cells. The older lesions tend to shrink down and are eventually represented by minute foci of fibrous tissue. The Aschoff nodes are unlike any known coccal lesion. The contrast was evident in a case in which a streptococcal infection was superimposed on an acute rheumatic

our search for the organism of acute rheumatism.

K. E. Birkhaug (Jour. of Inf. Dis., May, 1927) has isolated a distinct strain of streptococcus from tonsillar crypts and abscesses in cases of rheumatic fever and its syndromes. It was also found frequently in blood cultures, heart vegetations, and the urine and feces. It is described as a non-methemoglobin-forming, insulin-fermenting, bile-insoluble, toxigenic, Gram-positive streptococcus, and is distinguishable biologically from the groups of *S. viridans* and *hemolyticus*. Among 68 strains of this organism, 72 per cent. yielded a soluble toxic filtrate, as against only a very small percentage in the case of the *viridans* and *hemolytic* organisms. When tested intradermally with 0.1 c.c. of a 1:100 dilution of the soluble toxic filtrate of the new organism [Birkhaug test], 56 per cent. of adults and 76 per cent. of children with a definite history of rheumatic fever and its syn-

dromes reacted positively with lesions measuring more than 1 cm. in diameter. Ascending injections of filtrate in animals and susceptible humans produced a neutralizing antitoxin. Injected in rabbits, the organism always produced non-suppurative polyarthritis, subacute bacterial endocarditis, myocarditis and epicarditis, with unique tendency to mitral stenosis, extensive mural vegetations and occasionally myocardial degeneration, with nodular cellular arrangements. Injection intra-articularly and intramuscularly of large doses of the toxic filtrate in the writer's own person produced a typical acute polyarthritis of the rheumatic type, which



Section of human heart muscle showing an Aschoff node (A), together with an acute abscess (B). From a case of subacute infective endocarditis superimposed on acute rheumatism. (Kettle, in *Lancet*.)

carditis: A mitral cusp showed on 1 side a typical rheumatic thrombus vegetation with the deeper mononuclear-celled reaction, and on the other an area of ulceration with a polynuclear-celled infiltration and numerous cocci. A section through the wall of the left ventricle [see cut] showed a characteristic Aschoff node lying in actual contact with a small acute metastatic abscess. Until an organism can be shown capable of causing the Aschoff lesion experimentally, we shall have to continue

healed without suppuration or joint injury.

J. C. Small, who had already announced in 1927 (Amer. Jour. Med. Sci., Jan., 1927) the isolation of a streptococcus having specific immunologic identity and which he termed *S. cardioarthritidis*, in a more recent paper (*ibid.*, May, 1928) presents further observations upholding the specificity of this organism in rheumatic fever and Sydenham's chorea. The organism, he states, is found regularly in throat cultures of patients with rheumatic fever or chorea, and may, like the pneumococcus, occur in normal persons. It is seldom recoverable from the blood of rheumatic fever patients. In animals, it produces lesions in the myocardium, pericardium and valves, in the joints, and in the central nervous system. In the myocardium occur, after destruction of muscle fibers, infiltrations of cells, chiefly mononuclear, including large endothelioid cells and giant cells staining in the same manner as the cells of Aschoff's nodules. A tendency to chronicity is noted in animals surviving the acute stage. Opsonins for the organism in human patient's serum rise during the favorable course of the disease and remain high during convalescence and after recovery. An excessive dose of the vaccine of *S. cardioarthritidis* causes a prompt decrease of opsonins and exacerbations of focal symptoms in the joints and heart. [Obviously, confirmation by others of the clinical relationship of the organism described by Small or that of Birkhaug is required.—Ed.]

According to H. F. Swift, C. L. Derick, and C. H. Hitchcock (Jour. Amer. Med. Assoc., Mar. 24, 1928),

the hypothesis that in rheumatic fever there is a *hypersensitive state* (bacterial allergy; hyperergy) which is not strictly strain-specific, but embraces a wide range of streptococci, reconciles divergent observations and makes it understandable that the organisms described by different workers may indeed have been the exciting agents in the patients from which they were recovered.

Evidence has been collected by A. J. Abeloff and I. P. Sobel (Arch. of Ped., Sept., 1926) to the effect that rheumatic fever is to a distinct extent a communicable disease. In a total of 1031 rheumatic families studied, there were 46 per cent. with 1 or more cases added to the original case. On the other hand, 677 families with no original cases (non-rheumatic families) showed only 19.4 per cent. of rheumatic disease. E. P. Boas and S. P. Schwartz (Amer. Heart Jour., Apr., 1927) state that at times and under special circumstances rheumatic fever may assume epidemic proportions. The lungs are a source of reactivation or portal of entry of rheumatic infection. A close connection at times exists between bronchopneumonia and rheumatic carditis. Rheumatic fever should be regarded as a generalized infection of great chronicity, and attention should not be drawn too closely to 1 organ such as the heart or tonsils.

In an analysis of 393 cases, T. T. Mackie (Amer. Jour. Med. Sci., Aug., 1926) found that rheumatic fever in about 70 per cent. of all cases presents itself as a chronic disease, with periods of recurrence of the acute features. Serious cardiac involvement occurred in 68 per cent. of cases; but whereas between the ages

of 10 and 15 years 78.2 per cent. had heart complications in the 1st attack, after 25 years the incidence of heart disease in the initial attack fell below 50 per cent. Of rheumatic cases 80 per cent. showed foci of infection, as against 66 per cent. in non-rheumatic controls. Tonsillar infection was more than twice as common in the rheumatic fever cases as in the controls. Treatment of these foci seems to reduce the recurrences of rheumatic fever, but not altogether prevent them. Only 57 per cent. of the recurrences of acute rheumatism occur within 4 years, and since serious complications may occur during what seems to be an interval of quiet, observation should go into every detail, including blood counts and, if possible, electrocardiograms.

Coincidence of inflammation of the *nasal accessory sinuses* with acute polyarthritis in 3 cases is reported by Beselin (Deut. med. Woch., Dec. 17, 1926). Postmortem, he found sinus inflammations in 6 out of 18 cases of endocarditis.

**SYMPTOMS.**—A *cardiopulmonary syndrome* sometimes occurring in early rheumatism is described by O. H. Mavor (Glasgow Med. Jour., Mar., 1926). The signs are often the precursor of carditis; they should be looked upon as a danger signal and the patient treated accordingly: The cervical veins, especially on the left, are visible and pulsating, and appear to collapse on ventricular systole. On very slightly forced expiration they stand out prominently. In children or young adults the superficial veins emptying into the 2d left or right interspaces close to the sternum are often prominent. Pulsation is visible, or at least palpable, in the 2d and 3d

left interspaces. The resting pulse is rapid—about 100. Tachycardia with some irregularity appears on exertion. A rather peculiar bruit is heard over an area about the size of a half dollar in the vicinity of the 2d left interspace close to the sternum. It begins at or very shortly after the 1st sound, is loud, moderate in pitch, and rather rasping, running *crescendo* up to an accentuated 2d sound, the quality of which is like that of the rapping 1st sound in classical mitral stenosis. A common pulmonary systolic murmur may be heard outside of this special area.

M. A. Rabinowitz (Jour. Amer. Med. Assoc., July 17, 1926) calls attention to the occurrence of a *rheumatic pneumonia*. Sometimes there are only fleeting signs of lung involvement. A condition of splenization may develop which is not often found postmortem, being of the transient nature seen in joint involvement. The lung thus affected is dark red, moist, soft and only slightly crepitant. The condition differs clinically from lobar pneumonia in that there is no chill nor sudden rise of temperature, cough is slight, and the sputum is not rusty. There is pallor and cyanosis instead of flushing of the face, and toxemia symptoms are mild. There is an early dulness and loud bronchial breathing, with but few râles. These signs may clear up rapidly and reappear elsewhere.

**TREATMENT.**—Therapeutic endeavors with an *antiserum* based on his discovery of the *Streptococcus cardioarthritidis* as a causal factor of acute rheumatism are reported by Small (Amer. Jour. Med. Sci., May, 1928). Equine and bovine antisera were found equally effective. The

serum disease after the latter is much milder. Intradermal tests with plain serum for hypersensitiveness must be made before using serum. Where hypersensitiveness to bovine serum is found, horse antiserum should be used. In successful cases of serum treatment marked improvement occurred in 12 hours, pain in the joints first disappearing and then tenderness and swelling. In *chorca*, the serum often causes the movements to disappear within a week. The serum injection is at times followed, especially after excessive dosage, by local inflammatory reactions in the joints or even the heart. In rheumatic fever or retarded convalescence from it, after treatment with adequate dosages of the serum has been applied, the **vaccine** may be used, provided it is begun before the passive immunity conferred by the antiserum has passed off. The vaccine is given subcutaneously, at intervals of 5 to 7 days. The secondary reactions to the vaccine which have sometimes appeared, reaching their height from the 10th to the 14th day, constitute an obstacle in the vaccine therapy, since they may be superimposed on the primary reaction of the succeeding dose, causing a severe combined reaction.

In illustration of the possibility of combating rheumatic infection with **streptococcal antitoxins** that may not be actually specific, J. H. Barach (Jour. Amer. Med. Assoc., June 11, 1927) reports a case of acute rheumatic heart disease, showing all the classical features, including petechial spots and subcutaneous nodules, in which, salicylates and alkalies having largely failed, and the condition in the 8th week seeming desperate, 10 c.c. of **scarlet fever streptococcus antitoxin** (Lederle) were given intramuscularly.

Within 24 hours the fever began to recede and the pulse declined from 140 to 110. Lysis occurred and recovery was initiated.

Regarding **tonsillectomy**, a careful investigation of 133 rheumatic children in this connection has been reported by R. Miller (Brit. Med. Jour., July 3, 1926). He is in agreement with other observers as to the particularly high frequency of tonsillar disease in rheumatic children. Once a real chronic tonsil infection has been established there is no evidence to show that spontaneous recovery of the tonsils is possible during childhood. Tonsillectomy in the rheumatic child is rarely followed by any immediate rheumatic recrudescence. Some specialists claim that there is an immediate beneficial effect from tonsillectomy during an attack of rheumatism, but in the writer's experience the type of case in which the operation produces the most immediately favorable response is where there is protracted convalescence, with pallor, rapid heart and a swinging temperature. Study of the manifestations of rheumatism before and after the operation in 45 children for 1 to 5 years produced evidence strongly in favor of tonsillectomy. Sore throats, arthritis and carditis in all its forms were greatly diminished in tonsillectomized cases. *Chorca*, however, seemed totally unaffected by previous tonsillectomy, except for a suggestion of the heart being less damaged in such cases. The tonsillitis in chorea tends to be more of the chronic or subacute than of the acute painful variety.

Although **salicylates** are generally effective in the rheumatic attack, recurrences occur with undiminished frequency, according to O. Holsti



(Acta med. scand., Jan. 26, 1927). In cases with marked inflammation in the upper respiratory tract, he has seen no harmful result from dealing with the condition surgically as soon as complete recovery from the acute rheumatism has taken place. He deems such treatment of marked value in the prevention of recurrences. The subsequent course of the disease becomes much milder after such intervention. In cases with digestive disturbances, leading to a suspicion of infection through the gastrointestinal tract, he prescribes a special diet. In some others, careful protein therapy was instituted.

According to Kahlmeter (Berl. klin. Woch., May 14, 1926), the erythrocyte sedimentation test affords a useful criterion of complete recovery in acute polyarthritis.

Regarding gonorrheal arthritis, M. Rodriguez (Paris méd., Nov. 26, 1927) reports over 100 cases of gonorrheal complications, especially arthritis, in which excellent effects were obtained with injections of diphtheria anti-toxin.

Intravenous injection of 2 per cent. acriflavine solution was resorted to with uniform success by A. Pulido Martin (Siglo méd., Mar. 12, 1927) in 15 cases of gonorrheal arthritis after other measures had failed.

According to C. O. Ritch (Ill. Med. Jour., Nov., 1927), diathermy is of great service in this disorder, as well as in gonococcal acute epididymitis. Gonorrheal arthritis, and likewise rheumatic arthritis, may be much benefited by X-ray treatment, according to Kraus (Med. Klin., Feb. 18, 1927), although usually an exacerbation of pain occurs in the 3 or 4 days

following treatment. Good effects in 4 cases are recorded by Schulte (Münch. med. Woch., Apr. 29, 1927).

#### B. CHRONIC ARTHRITIS.—

**ETIOLOGY.**—The chronic arthritides are divided by C. F. Painter (Boston Med. and Surg. Jour., Jan. 6, 1927) into 3 groups—infectious (toxic), metabolic (hypertrophic), and atrophic. The metabolic variety is rarely seen until after the age of 40—usually from 45 to 60. The toxic variety occurs at a period when infections are most common, the majority having their incidence at 35 to 40. The hypertrophic (metabolic) lesions are confined almost wholly to the marginal cartilage and show almost no capsular infiltration. Rarely is there an excess of joint fluid. There is little atrophy and far less deformity than in the toxic type. Muscular spasm is absent. Motion may be restricted, but this is usually the result of limiting osseous spurs. There are few or none of the cardinal signs of inflammation, except in 1 condition—true gout. Many of the perplexities in the classification and treatment of arthritis can be materially lessened by care in history taking and physical examination. One should not forget the possibility of a focal infection or that the X-ray may throw light on pathologic conditions, but it should not necessarily be assumed that there must be a source of toxic absorption. The terms “arthritis deformans” and “osteoarthritis” are carelessly chosen, and some observers mean 1 type and some another when they use either term. The terms “degenerative” and “proliferative” of Nichols and Richardson describe gross pathology, but leave the question of underlying pathology entirely in abeyance.

In a statistical analysis of 700 cases of chronic arthritis, R. Pemberton and E. G. Peirce (Amer. Jour. Med. Sci., Jan., 1927) found foci of infection in about 70 per cent. The most frequent sites of focal infection were dental, nose and throat, and genitourinary, in the order named. Symptoms referable to the nervous system were present with surprising frequency. Malignant neoplasms and active tuberculosis were very infrequent. Diabetes was met with in only 6 cases. The blood-pressure tends to be normal or low, in many cases reaches strikingly low figures, and probably contributes toward the refractory nature of the syndrome. Including the most advanced types, 24 per cent. of the cases recovered completely; 9 per cent. were unimproved, 73 per cent. definitely improved.

*Chronic infectious arthritis* is deemed by R. L. Cecil and B. H. Archer (*ibid.*, Feb., 1927) a clinical entity usually distinguishable from other forms of joint disease. It is a chronic proliferative arthritis of distinctly inflammatory character, almost always migratory, and usually associated with 1 or more foci of infection. Cases of specific infectious arthritis (gonococcus, tuberculous, staphylococcus, etc.) are not included. The condition is apt to occur in young people, and is prone to attack the metacarpophalangeal and proximal phalangeal joints. Sodium salicylate or aspirin is practically useless (therapeutic test). In a series of 200 such cases, the tonsils and teeth were found to be the commonest foci of infection. In the older patients the teeth are more apt to be responsible than the tonsils. The results in treatment depended as much on the dura-

tion of the disease as upon the therapy employed. Eighty-two per cent. of the cases were cured or improved; in the unimproved cases the average duration of the disease previous to treatment was 5 years.

According to L. T. Swaim and L. M. Spear (Boston Med. and Surg. Jour., Sept. 1, 1927), determination of the *basal metabolic rate* is advisable in all cases of chronic arthritis. Of 200 cases, 30 per cent. had an abnormal rate, almost equally divided between plus and minus. In the atrophic and especially the hypertrophic groups, the tendency was toward a minus rate. In the hypertrophic group, only 54 per cent. were normal.

Some of the cases, showing a plus metabolism, but with a very erratic and unstable graphic chart, dropped to a low minus upon exhibition of thyroid extract; then, as the thyroid was increased, the rate gradually rose to normal and the chart became much more stable. This is ascribed to relief from nervous tension in a potential hypothyroid case. That administration of **thyroid** in some cases would be of distinct benefit was borne out by clinical experience.

There is evidence, according to S. Miller and F. B. Smith (Quart. Jour. of Med., Apr., 1927) that the *achlorhydria* sometimes present in chronic arthritis allows more ready multiplication of streptococci in the intestine and may be, therefore, an accessory factor in the etiology of the disease.

*Infection of the uterine cervix* is recognized by Mazer and Sabel (Med. Jour. and Rec., Jan. 4, 1928) as a possible cause of chronic arthritis. To eliminate the infection they employ the **electric cautery** in such man-

ner as to destroy all of the gland-bearing mucosa.

*Syphilitic arthritis* is discussed by Schlesinger (Wien. klin. Woch., Feb. 5, 1925) on the basis of 32 cases. In these patients diagnostic features are the exacerbation of pain at night, circumscribed tender points, failure of salicylates to relieve, even in the presence of fever, and the efficacy of specific treatment or a local dressing of **mercurial ointment**. The blood Wassermann is often negative, but the fluid aspirated from joints frequently positive. While any joint may be involved, the sternoclavicular joints show particular predilection. **Mercury** and **iodides** should constitute the 1st therapeutic agents administered.

In a case of chronic polyarthritis in a congenitally syphilitic girl of 15 years, reported by P. Nobécourt (Rev. méd. de la Suisse rom., Mar. 10, 1926), the knees, ankles, and joints of the wrists and hand had become gradually diseased in the course of 4 years, with muscular atrophy and adenitis. The blood Wassermann was positive. Recovery took place under the **arsenicals**.

**TREATMENT.**—Much attention has been paid of late to the treatment of various types of arthritis with **ortho-iodoxybenzoic acid**, a compound introduced clinically by A. G. Young and J. B. Youmans (Jour. Amer. Med. Assoc., Sept. 4, 1926). All but 4 of their 43 cases were considered to be chronic, and the series included examples of *hypertrophic* and *atrophic* forms, as well as *gonococcal arthritis*. The patients received 6 to 25 injections of the drug in courses of about 6 injections, at intervals of 3 or 4 days, usually with a lapse of 6 weeks between courses. Improvement was marked in 56 per cent., moderate in

23 per cent., and slight in 14 per cent., while 7 per cent. were unimproved.

The drug is an iodine substitution product of benzoic acid, with 2 double-bonded oxygen atoms linked to the iodine. It occurs as a white powder which turns reddish-brown on exposure to light, soluble with difficulty in warm water. When dry, it explodes if heated, giving off purple fumes and an odor of iodine. It is a fairly strong acid. Its sodium and ammonium salts are readily soluble. It is a physiologic oxidizing agent, inasmuch as it can furnish oxygen for the peroxidase reaction of blood, and experimentally is a depressant to the vasomotor and respiratory centers (Loevenhart and Grove). The sodium salt was found by Arkin to be strongly bactericidal, though less so against staphylococci than against the typhoid, colon and pyocyaneus bacilli; it was as active in blood serum as in water.

Millard Smith (Boston Med. and Surg. Jour., Feb. 24, 1927) has confirmed the favorable experiences of Young and Youmans with the drug and reports striking benefits in a series of 33 cases. Its action, while similar to that of the salicylates, is many times more effective. At first intravenous injections were used, but these produced a constitutional reaction, and it has also been found to be effective orally, causing practically no discomfort. It is analgesic, relieves muscle spasm, and reduces edema. These symptoms are the indication for the drug, rather than any particular type of arthritis. Chronicity of a joint lesion is no contraindication to a trial of it. It is used in the form of the sodium or ammonium salt. Intravenously, a 1 per cent.

solution is best, at body temperature, not boiled, and made up within 2 hours before injection. Seven to 15 minutes should elapse in the injection of a 1-Gm. dose. The initial dose is 0.5 Gm. ( $7\frac{1}{2}$  grains), the usual therapeutic amount 1 Gm. (15 grains); as much as 1.5 Gm. (23 grains) has been given without untoward effect. The dose may be repeated on alternate days indefinitely without apparent harm. The dosage and intervals are regulated by the symptoms, degree of progress and severity of reaction. A few patients receive benefit only from intravenous use. By mouth the drug may be given in 2 or 3 per cent. solution, in pill or capsule form, on an empty stomach with 2 glasses of water. The 1st dose is usually 1 Gm., and after that, 1.5 Gm. This may be repeated daily or less frequently. It has been given as a rule every other day. The drug is effective in 2 per cent. solution by rectum. Even in powder form, it should be kept from the light, as sunlight turns it brown by splitting off iodine. The salts are not affected by sunlight. For oral and rectal use it is convenient to dissolve the free acid by adding an excess of sodium bicarbonate.

Smith's 33 patients received over 100 intravenous and over 50 rectal or oral doses. They comprised: *Arthralgia*, 2; *acute arthritis*, 12; *chronic arthritis*, 16; *gonorrheal arthritis*, 2; *rheumatic fever*, 1. One patient with arthralgia, following a single intravenous dose of 1 Gm., had complete and immediate relief from a generalized joint affection which had kept her in bed for 2 weeks in spite of large doses of salicylates. An operation on the nose was then done, and relief was permanent for 6 months.

The other arthralgic received 3 1.5 Gm. doses by mouth and obtained complete relief for 1 month. Out of the 12 cases of acute arthritis all but 1 obtained marked relief from pain, stiffness and swelling from each dose of the drug, but only 2 showed no recurrences. Of the 16 patients with chronic arthritis, only 3 received no relief. One patient, unable for 10 years to lift a glass of water to his mouth with his left hand, could do so easily after 6 intravenous injections. He was also enabled to close the fists firmly and relieved of a marked contracture of both elbows. The writer places the compound in the 1st rank of drugs available for arthritis, although there seems to be a group of patients in whom it produces no relief. With its use, patients may be encouraged to use their joints as much as pain will allow; active function is important in the prevention of permanent deformities. With its use, also, **muscle massage** may be instituted earlier and more vigorously in subacute joints than is usual. In a later communication (*ibid.*, Mar. 31, 1927), Smith reports the substitution of an ammonium salt known by the trade name **amiodoxyl benzoate** for the free acid in intravenous injection, with very much less reaction and at least an equal therapeutic effect. The benefit by mouth is not comparable to that from intravenous use. In arthritis due to toxin absorption from the gastrointestinal tract (sometimes suggested by urticaria, asthma, unexplained fever and gastrointestinal upsets), the drug gives slight, if any relief. A highly putrefactive stool and chronic constipation are suggestive of this condition. In these cases **dimol** has proved efficacious.



**Baking** without **muscle massage** and **active motion** is contraindicated.

According to J. E. Cottrell (Amer. Jour. Med. Sci., Nov., 1927), the drug, having given over 80 per cent. of improvement in various types of arthritis, deserves extensive trial. The cases which will not be benefited by it cannot be predicted. The 21 cases treated by him comprised: *Acute infectious*, 2; *subacute infectious*, 3; *chronic infectious* (arthritis deformans), 13; *gonococcal*, 2. All but 3 of the cases showed improvement of varying degree. Relief of pain was prompt and marked, especially in acute and subacute cases; some patients complained of a preliminary increase of pain for a few hours after an injection. In most chronic cases with crippling there was improvement of function, from slight to very marked. The drug is best given in courses of 6 or 8 doses at semiweekly intervals, with a rest of 3 to 6 weeks between courses. One patient received 3 courses totaling 20 injections. Others received 3 to 17 doses. All but 3 received at least part of their treatment intravenously. Where great difficulty is experienced in intravenous injection, the drug may be given by mouth or by rectum. For oral use, **calcium o-iodoxy-benzoate** is preferable to the ammonium salt, as it seems to produce less gastric irritation. A larger dose, usually 1.5 Gm. (23 grains), is given in capsules of 0.5 Gm. (7½ grains) each during a few hours, the patient preferably fasting or eating very lightly beforehand. The dose is repeated about twice a week. Slight nausea is sometimes induced, rarely vomiting, and very rarely (1 patient only) any other reaction. For rectal adminis-

tration, the dose is 1 or 1.5 Gm. of **ammonium o-iodoxy-benzoate** in 2 per cent. solution, given after a cleansing enema; reaction is unusual, and the drug is usually retained. Intravenous injection is the method of choice, and for this the ammonium salt is used. The standard dosage of ammonium o-iodoxy-benzoate is 1 Gm. dissolved in 100 c.c. (3⅓ ounces) of sterile distilled water, given about twice weekly. It is injected by the gravity method, and must be given slowly, 10 to 20 minutes being allowed for 100 c.c. to run in. Rapid administration tends to produce severe reactions.

Since Pemberton *et al.* have shown that in many arthritics there is increased oxygen saturation of venous blood and hence presumably decreased removal of oxygen in passage through the capillaries, an obvious possibility is that the power of o-iodoxy-benzoic acid to act as a physiologic oxidizing agent is a factor in the results.

With the use of the drug should be combined a search for and **treatment of foci of infection**; persistent **physiotherapy** in chronic cases, and **orthopedic treatment** of deformities.

According to R. L. Jeffery and K. S. Burns (Northw. Med., Dec., 1927), the most hopeful and satisfactory cases for treatment with **o-iodoxy-benzoic acid** are those of *acute* type of not long standing. *Gonorrheal arthritis* as a class seemed to give the best results of all. Of a total of 24 cases of arthritis treated, 11 were completely relieved and remained so; 9, markedly improved; 3, not improved or only slightly improved, while one case failed to complete the treatments.

**Protein therapy** in chronic arthritis has been fairly extensively tried. W. Yeoman (Lancet, June 26, 1926) deems the most reasonable theory of its action to be that of Herrmann, *viz.*, that foreign protein serves as a stimulus for the liberation of specific antibodies where previously injected antigen has been unable to do so. In the 50 cases he records, he used **typhoid-paratyphoid vaccine** comprising about 2 parts of typhoid bacillus to 1 part each of paratyphoids A and B. The initial dose was 50 million, and each subsequent dose was increased by 100 million. The time between injections was 4 days. All cases had balneologic treatment in the intervals. After an average stay of 4 weeks in the hospital, 44 cases were discharged as definitely improved and 6, unchanged. The types responding best are the *acute* and *sub-acute* with the disease confined to the periarticular tissues. When the joints themselves are affected, definite improvement occurs, with arrest of the disease. Cases of the menopause group, of the chronic villous type, and those showing achylia do not respond well. Though the reactions are severe, contraindications are few, *viz.*, myocardial disease, gross kidney disease, chronic alcoholism, tuberculosis and syphilis. The ability of these injections to cut short an attack of *rheumatic fever* has been proved.

Following parenteral injections of various **proteins** E. Faber (Ugeskr. f. Læger, July 1, 1926), among 29 cases of chronic polyarthritis, witnessed complete recovery in 2, and varying improvement in 16. Great persistence in keeping up the treatment is required for success, just as in tuberculosis. Klewitz (Deut. med. Woch.,

Oct. 7, 1927) finds that protein therapy in chronic arthritis permanently arrests the disease only in exceptional instances; generally within a year further treatment becomes necessary.

Making cultures from chronic arthritic joints excised for orthopedic purposes, J. and N. Mutch (Lancet, May 14, 1927) were led to conclude that *B. fallax*, if not a common cause of arthritis, is at least an occasional inhabitant of diseased joints. The organism is one isolated occasionally in the past from gangrenous wounds and cases of puerperal septicemia. That it is of distinct importance in arthritis is suggested by the marked effects obtained with **bacillus fallax vaccine** by the writers, especially in the more chronic varieties and in the treatment of residual pain and swelling in joints that had improved up to a certain point under **autogenous vaccine**. They advise adding *B. fallax* to the autogenous vaccine in chronic arthritis, particularly in joints damaged previously by injury or coccal infection or the seat of disease which has been non-pyrexial and insidious from its outset.

In a case of *Still's disease*, Reimold and Stoeber (Mon. f. Kind., Mar., 1926) observed improvement following the use of an **autogenous streptococcus viridans vaccine**.

Cumberbatch and C. A. Robinson (Brit. Med. Jour., Apr. 3, 1926) recognize a group of non-infectious arthritis occurring at either end of the menstrual life. In at least some, the disorder is due to *ovarian insufficiency*. In such cases both the arthritis and the impaired general health respond well to application of heat to the pelvic organs by **diathermy**.

**Sulphur** is deemed useful by Forestier (Prog. méd., Nov. 13, 1926) in chronic arthritis, but it must be used in a non-oxidized form, *viz.*, either as sulphuretted compounds or hyposulphites. The utility of **sulphur mineral waters** in chronic rheumatism is already well known.

According to T. E. Lawson (Pract., Aug., 1927), biweekly intramuscular injections of 10 to 500 c.c. (2½ drams to 1 pint) of **sea water** will often arrest arthritis where all else has failed. In 27 cases, only 3 failed to improve under these injections. Seven patients seemed cured, 6 improved moderately, and 11 were greatly improved, but still had twinges of pain and some limitation of motion. The intervals between doses may be adjusted according to the duration of improvement after each dose. Anorexia and depression result from overdosage.

Certain forms of **physiotherapy** are extolled by R. G. Gordon (Brit. Med. Jour., Jan. 9, 1926), *viz.*, **massage**, **active** and **passive movements**, the **faradic** and **galvanic currents**, **radiant heat**, **ionization** and **diathermy**. With the possible exception of radiant heat and diathermy, these are all usually available to any practitioner in country districts. Ionization will serve much the same purpose as diathermy, if it is not procurable, and can be administered with a galvanic battery if a milliamperemeter is connected with it.

In chronic arthritis of the *knee*, W. G. Macdonald (Pract., Feb., 1927) applies **extension** by traction and then applies a **plaster cast**. After some weeks the latter is taken off, an attempt at further extension made, and a fresh cast applied.

Four cases of chronic infectious

arthritis are reported by M. F. Arbuckle (Jour. Amer. Med. Assoc., Sept. 25, 1926) in which improvement was obtained only after **treatment of the nasal accessory sinuses**, disease of which is believed to have been actually the cause of the chronic arthritis.

Among the 200 cases of chronic infectious arthritis reported by Cecil and Archer (Amer. Jour. Med. Sci., Feb., 1927), **tonsillectomy** was done in 85; **teeth** were **extracted** because of apical abscesses in 21; many were treated for pyorrhea; 8 had **prostatic massage** and **bladder irrigations**; 5 were treated for disease of the cervix; 4 had infected **sinuses punctured** and irrigated; the **middle ear** was treated in 2, and the **gall-bladder removed** in 1. In many, **colonic irrigations** were given. **Vaccines** were used in 39 cases, usually only after a thorough search for foci of infection. A polyvalent **streptococcus hemolyticus vaccine** was used in 27 cases in doses of 0.2 to 1 c.c. (4 billion organisms per c.c.). **Autogenous vaccines** from the deep crypts of the tonsils, prepared just after their removal, were used in 7 cases. **Physiotherapy** was used as adjuvant in nearly all cases, most often in the form of **baking**, **massage** and **diathermy**. Sixty-two per cent. of those with dental extractions were cured or improved by this procedure. The *S. hemolyticus* vaccine did not show uniform results, but the 7 given autogenous vaccine seemed markedly improved. Physiotherapy proved a valuable aid.

According to Small (*loc. cit.*), in some cases of subacute and chronic arthritis apparently belonging to the rheumatic group, a **soluble antigen**

prepared by suspending the writer's *S. cardioarthritidis* in normal saline (100 millions per c.c.) may be advantageously used in treatment without previous use of his antiserum. A patient with atrophic or hypertrophic arthritis who shows marked general and focal symptoms following subcutaneous injection of 0.1 to 0.5 c.c. of a 1:1000 dilution of the soluble antigen will be definitely benefited by the antiserum, followed by injections of the soluble antigen.

High colonic irrigations have given good results in subacute and chronic arthritis in the hands of R. G. Snyder and S. Fineman (Amer. Jour. of Roentg., Jan., 1927). While soapsuds enemas were observed by X-ray to clear out fairly but not completely the residues from a barium meal, high or low irrigation was more effective. In 15 consecutive tests the irrigating tube was passed beyond the sigmoid in 86 per cent. It was proven that the cecum may be reached by the tube. Careful and prolonged training is required for safe passage of the tube. The chief value of inserting it into the proximal colon is that it appears in some cases to set up greater contractility of the colon.

#### C. ARTHRITIS DEFORMANS.

—In a series of 1002 cadavers, the order of frequency of involvement of the larger joints in arthritis deformans was found by J. Heine (Arch. f. path. Anat. u. Phys., Apr. 30, 1926) to be as follows: Knee, acromioclavicular, elbow, hip, and shoulder. Until the 70th year, the 1st metatarsophalangeal joint came just after the knee. In spondylitis deformans, the thoracic spine alone is most often affected, or the lower thoracic and upper lumbar spine.

Several studies of the metabolism in arthritis deformans have lately appeared. Mark (Zent. f. inn. Med., July 2, 1927) reports having found a *hypercalcemia* in 7 cases, whereas in acute and chronic rheumatic arthritis the calcium of the serum was normal. On the other hand, Nachlas (Jour. of Bone and Joint Surg., Jan., 1927) did not find any abnormality in the serum content of either the calcium-phosphorus or the calcium-phosphorus product. There was a tendency, however, for the phosphorus readings in the osteoarthritic group to be lower than those in the rheumatoid group. According to researches by Cawadias (Lancet, June 18, 1927), *thiopexy*, i.e., that special metabolic function of the organism through which the sulphur equilibrium is maintained, is definitely inefficient in arthritis deformans. There is an increase of sulphur catabolism; the sulphur-containing proteins are affected. In most cases the excretion of ethereal sulphates is slightly above normal; this slight "excess of sulphoconjugation" may be ascribed either to a certain loss of chondroitinsulphuric acid, which is an important constituent of cartilage, or to an abnormal protein metabolism. Microbes, toxins, or even dampness may be considered to act in arthritis deformans on predisposed regulators of sulphur metabolism, the articular lesions being probably the ultimate result of the metabolic troubles thus produced. In some patients an improvement of the thiopexic function was seen under the influence of colloidal sulphur treatment. In 1 patient the quantity of ethereal sulphates decreased distinctly after such treatment, and this coincided with complete recovery. Jolk-



wer (Arch. f. Kind., Nov. 11, 1927) recognizes a *thyrogenous arthritis*, and advises an investigation of the thyroid functioning in all cases of chronic arthritis.

According to researches by Seeliger (Münch. med. Woch., June 18, 1926), a slight change of the reaction of the synovial fluid towards acidity may result in arthritis deformans when *trauma* to the joint is superadded. Furthermore, the lesion of this joint may, by causing increased functional strain on another joint, provoke arthritis likewise in the latter. For complete absorption of a hemorrhage into a joint the writer found normal synovial alkalescence to be a prerequisite.

A highly selective group of *streptococci* is regarded by Hadjopoulos and Burbank (Jour. of Bone and Joint Surg., Apr., 1927) as the primary cause of rheumatoid arthritis. A secondary rôle may be played by diphtheroid organisms, bacilli of the paracolony group, and *Staphylococcus aureus*. On the other hand, according to S. H. Clifford (Amer. Jour. Dis. of Childr., July, 1926), *dysentery bacillus* infection may account for some cases. Out of 7 cases reported, 4 showed evidence of an active or past dysentery infection. Two had had a definite diarrhea, blood-stained and mucoid in 1. A dysentery bacillus of the Flexner type was isolated from the stools of 1. All 4 had serum rich in dysentery agglutinins.

**TREATMENT.**—From physical, laboratory and X-ray examination of 245 cases of chronic arthritis of the deforming type J. V. Barrow and E. L. Armstrong (Cal. and West. Med., Mar., 1927) concluded that 96 per cent. were definitely gastrointestinal cases first. Intestinal protozoa were

very frequent, comprising *Amœba histolytica* in 56 per cent. of the cases; *Chilomastix mesnili*, 50 per cent.; trichomonas, 8; giardia, 3.7; *Amœba coli* or *councilmanni*, 4.7; *craigia*, 2.8, and mixed cases, 28. Very few patients felt that extraction of all the teeth or tonsillectomy had helped them materially. The writers' treatment usually began with **emetine hydrochloride**,  $\frac{1}{3}$  grain (0.02 Gm.) by deep hypodermic injection on alternate days or, in severe cases, daily. After the 3d injection the dose was given intravenously. After 3 weeks of this treatment, the interval was increased to twice weekly for 2 or 3 weeks, then to weekly for a month or 2. To forestall muscle tiredness and act as tonic, weekly or biweekly intravenous injections of a preparation of **iron cacodylate** were given. Often with the emetine or instead of it, 5-grain (0.3-Gm.) **ipecac** pills, salol-keratin coated, were used, 6 pills being usually given at 1 a.m., an **ice-bag** applied to the epigastrium, and the patient requested to rest quietly on the right side. The dose was increased nightly by 2 pills up to 12, then stepped down again to 2 pills.

In stubborn cases, **fluidextract of ipecac**,  $\frac{1}{2}$  to 1 dram (2 to 4 c.c.), with 4 ounces (120 c.c.) of salt solution, was sometimes given **by duodenal tube**. For both amebiasis and *giardiasis*, 0.75 Gm. of **neoarsphenamin** in 6 ounces (180 c.c.) of salt solution was given similarly. Three to 5 doses were given at 4 or 5 day intervals. Frequently **emetine bismuth iodide** in a 3-grain (0.2-Gm.) salol-keratin coated capsule was given at midnight, in the same manner as the ipecac pills, with temporary discontinuance when poorly borne. In *constipation*

cases, the writers found a capsule of **calcium phosphate**, 4 grains (0.25 Gm.), and **alcresta ipecac**, 6 grains (0.4 Gm.), 3 times daily before meals, a valuable adjunct. Likewise as an antiparasitic, **neoarsphenamin** by duodenal tube and intravenously proved generally of assistance. In *acute colitis* cases, **stovarsol** by mouth was of considerable service, but the effects need careful watching.

Sometimes other drugs, as **chaparro amargosa**, sulphur and bismuth were used. Enemas of **potassium permanganate**, 1:5000, were of value. The thermal death-point of 47° C. in **colonic** and **duodenal lavage** has been used with favorable effects by De Rivas.

In addition to the above measures, every effort was made to restore normal bowel functioning, if necessary by **corrective surgery**, as in ileal stasis, cecal retention and prolonged colon delay. Dietary treatment failed to give any measurable results. In general, among 209 "fairly treated" cases, there were excellent results in 30.6 per cent., good results in 42.2 per cent., and fair results in 20.5 per cent.

In 50 cases of hypertrophic or atrophic arthritis, L. S. Ashcroft, L. Cunningham and T. P. McMurray (Brit. Med. Jour., July 4, 1925) gave routinely large amounts of 0.4 per cent. **hydrochloric acid** and a **carbohydrate-free diet** over a period of some months. Lessening of pain and improvement of mobility were observed in nearly every case, irrespective of whether foci of infection were or were not removed.

R. Pemberton (N. Y. State Jour. of Med., Aug. 1, 1926) states that the **diet** indicated in suitable cases of

chronic arthritis consists essentially in curtailment of the caloric intake below that which has been customary for the individual. The propriety of dietary treatment is arrived at partly through the exclusion of other causes of the disease. A practical rule consists in allowing 30 calories per kilo. of body weight according to the usually accepted approximate requirements for rest, remembering, however, that in fat persons, this amount is generally grossly in excess of the needs. **Reduction** is best effected from the **carbohydrates**, although it is generally necessary to curtail proteins and fats also. A minimum nitrogen intake of 0.7 to 1 Gm. of protein per kilo. must be allowed. An abundance of green vegetables satisfies the psychic factors in eating and stimulates the digestive juices and peristalsis. Sometimes a sharper reduction to perhaps 1000 or 1100 calories a day is necessary at first, with the allowance soon after increased to the point of nutritive equilibrium while the patient is kept confined to bed. Caution is required in using the diet treatment in persons already undernourished, anemic, or suffering from tuberculosis, infections, etc.—unless, as is sometimes the case, anemia, joint destruction and pain are being aggravated through ingestion of a surfeit of food. After destructive influences have abated, **cod-liver oil** is of value.

**Vaccine therapy**, according to K. Stone (Pract., Sept., 1927), is of most service in early cases of rheumatoid arthritis. An **autogenous vaccine** prepared with streptococci isolated from any accessible focus of infection should be administered in addition to **removal of the focus**. A **mixed stock**

**vaccine** should be used where no infective focus can be found.

J. N. Cruickshank (Med. Jour. and Rec., May 20, 1925) has used **protein shock therapy** in rheumatoid arthritis by both the intravenous and intramuscular routes. For the former, he uses **typhoid bacillus vaccine** in doses of 100 million bacilli, increased if necessary to 150 or 200 million, injected slowly into an antecubital vein, at intervals of 5 to 7 days. Less disturbing to the patient, and quite as satisfactory in the writer's experience, is the intramuscular injection of 0.3, 0.6 or even 1 Gm. (5 to 15 grains) of **peptone**, in a 7.5 per cent. solution. If prepared by the user from bacteriologic peptone, the solution in normal saline should be filtered twice through fine filter paper and sterilized by heating to 75-80° C. for 30 minutes on 3 successive days. The aim in administration is to cause a rise of temperature to about 101° F. (38.33° F.). As a general rule, 4 or 5 injections at about weekly intervals are satisfactory. By combining ordinary treatment with protein shock it appears possible to accelerate recovery of movement in some cases and, in a few cases at least, to arrest the disease.

According to E. Payr (Beitr. z. klin. Chir., cxxxvi, 260, 1926), distention of the capsule of a joint the seat of arthritis deformans by repeated filling with 0.5 per cent. **procaine-adrenalin** solution under pressure is valuable in relieving pain and enabling the patient to tolerate **massage** and **hyperemic treatment** in various forms. A permanent increase in the joint fluid can be obtained by injection into it of **camphorated phenol** or by **X-ray** irradiation. In

the chronic infectious form of secondary arthritis deformans, **injections to soften adhesions** and indurations may be given, preceded by anesthetizing injections. In cases where surgery is needed, conservative **arthrotomy** will often serve well, although in severe cases involving the hip, favorable results are frequently given by **resection**.

**D. TUBERCULOUS ARTHRITIS.**—Hibbs and Von Lackum (Jour. Amer. Med. Assoc., Oct. 24, 1925), discussing the end-results in 77 cases of tuberculosis of the *knee*, state that out of 41 cases that had not died, been operated upon for bone fusion, or shown by later events not to have had tuberculosis, 16 had already relapsed at the time of writing, while only 27 were inactive—3 with bony ankylosis, 2 with fibrous ankylosis, and 22 with varying degrees of motion and deformity. The average time at which relapse occurred was 7 years after discharge from the hospital. The methods of diagnosis hitherto used are wholly untrustworthy. There is no method of making a diagnosis in knee-joint tuberculosis except by aspiration, with guinea-pig inoculation, or by exploratory operation, with tissue examination and guinea-pig inoculation. Through inaccurate diagnosis, patients who do not have the disease are being subjected to long periods of vain treatment. Prolonged immobilization, especially in children, frequently does permanent damage. In the series referred to, conservative methods yielded a cure only in 3 cases. **Fusion** of the knee by operation offers the only means now known of curing the disease, and should be done early. It may be done even in the 6th year without dis-

turbing growth of the leg. Both the prognosis and treatment of knee tuberculosis will have to be reoriented. Elsewhere, Hibbs (South. Med. Jour., Apr., 1927) states that the results in conservative treatment of tuberculosis of the *hip* are still worse, and that there is no evidence yet to prove that heliotherapy has any particular influence upon the progress of joint tuberculosis.

The end-results, likewise in knee tuberculosis, in 211 cases treated between 1912 and 1922 are given by F. Martens (Beit. z. klin. Chir., cxxxv, 631, 1926). Under conservative treatment in 89 cases, consisting of **immobilization** in a **cast**, natural or artificial **light therapy**, and **puncture** of abscesses, the good results under 15 years of age were 62.5 per cent., but only 18.7 per cent. after that age. Such relatively conservative measures as **curettage** and **excision of synovial sacs**, employed in 6 cases, yielded only 1 good result. **Resection** was performed in 105 cases. In the 30 operated on before the age of 15 there were 21 good and 9 poor results, while of the 75 over 15, 64 had good and 11 poor results. Primary **amputation** was done in 11 cases, with 6 deaths. On the whole, resection is the method to be favored, even in very young patients.

Out of 194 cases of knee tuberculosis operated on by M. S. Henderson and H. J. Fortior (Jour. of Bone and Joint Surg., Oct., 1927), 171, or 88.3 per cent., obtained firm bony union with good function. There was no operative mortality. In 4 of the 22 cases in which union failed to occur, the bones were induced to unite by a **bone graft**. In 5 of the remaining 18, **amputation** was later performed.

P. Fredet (Jour. de chir., Mar., 1926), in carrying out **resection** for tuberculous knee, employs an **extra-capsular** operation. Of 27 patients thus dealt with, without operative mortality, all but 2 appeared clinically cured, and the X-ray showed perfect union.

In tuberculosis of the *shoulder*, an **operation** devised by Baron is endorsed by E. Schulhof (Zent. f. Chir., July 4, 1925). The head of the humerus is decapitated, but left *in situ*. A firm arthrodesis is obtained by implanting the shaft in the scapula and the tuberculous process heals on account of the immobilization. Pain disappears in 2 or 3 months, regeneration of the atrophied muscles occurs, and soon the functions of the limb are restored. In the case of a boy of 15 cited, the ultimate shortening was only 0.5 cm. ( $\frac{1}{2}$  inch). The procedure is not feasible in the presence of an abscess or sinus.

In *open tuberculosis of joints*, Benci (Policlin., July 20, 1925) first carefully cleanses the margins of the sinus and the adjoining skin, removing **granulations**, and then puts on a **cast** as though no sinus were present. No local disturbance was found to result from the prolonged contact of the pus with the skin, and the cast is left on until its renewal becomes necessary. Among numerous cases of *knee* and *elbow* involvement thus dealt with, the discharge soon ceased and normal function was restored in a much shorter time than with the ordinary procedures. X-ray examination always showed **recalcification**, and joint cartilage destruction was minimized.

**E. SEPTIC ARTHRITIS.**—Three cases of suppurative arthritis in



which organisms conforming to the *B. influenza* type were recovered in pure culture are reported by J. F. Taylor (Lancet, June 25, 1927). Since 1899 only 9 such cases have been recorded. The ages of the 3 patients were 7, 18 and 8 months, respectively. All of the 12 cases now on record were in children. In some the arthritis was attended with fatal pyemia and meningitis. In the absence of these complications the patient recovered. The prognosis as to return of function of the joint itself is good.

Experimental *radium arthritis* in rabbits has been investigated by A. G. T. Fisher (Brit. Med. Jour., Feb. 19, 1927). Introduction into the joints of radium in platinum tubes caused a fulminating, destructive, suppurative arthritis. In 1 animal, a chronic "rheumatoid arthritis" developed, while in another an ossifying periosteal sarcoma developed from the lower end of the femur.

**TREATMENT.**—Among 49 cases of acute suppurative arthritis in *children* reported on by R. I. Harris (Jour. of Bone and Joint Surg., Oct., 1925), there were 6 deaths. Of the 45 joints involved in the 43 survivors, in 5 the condition was due to a penetrating wound, in 14 to extension from a neighboring focus, and in 32 was hematogenous. The superiority of **arthrotomy** with **fixation and extension** over **aspiration** was shown in that whereas 62.2 per cent. of the joints had a normal range of movement on recovery after the former procedure, with only 37.8 per cent. of ankyloses, out of 8 cases treated by aspiration only 3, or 37.5 per cent., had the normal range of movement and 5 were ankylosed. The recovery of normal range was commonest in the hematogenous cases (69 per cent.)

and least common in the wound cases (40 per cent.). Of 10 cases operated upon on the 4th day or earlier only 2 developed ankylosis, while of 23 operated upon on the 5th day or later, 15 developed ankylosis.

C. Willems (Gaz. des hôp., Oct. 30, 1926) continues to advocate prompt **active mobilization** after, *e.g.*, a vertical **arthrotomy** on each side of the patella, the wound being left widely open. Such treatment avoids many synovectomies, resections and amputations, and gives unsatisfactory results only when the patient is timorous or the treatment insufficiently persisted in. On the other hand, G. A. Caldwell (South. Med. Jour., Aug., 1926) asserts that, while **arthrotomy** by 1 or more incisions, adequately large, is indicated as soon as the diagnosis is made, immediate active immobilization seems unnecessary, since the results of the Willems method are no better than, if as good as, those where arthrotomy has been followed by fixation.

According to F. J. Cotton (Jour. of Bone and Joint Surg., Apr., 1926), a joint can be sterilized as long as infection is confined to the synovial cavity, and as the procedure he advocates, if properly done, is harmless, it should be employed even in joints that might get well of themselves, since recovery will be quicker if the pus and fibrin are removed. In the case of the *knee*, an incision on the outer side is made, the quadriceps pouch entered by a  $\frac{1}{3}$  inch incision, and **irrigation** begun with a blunt-nozzled syringe, only the tip of which enters. Under a head of 18 inches or less, the joint is distended with 1:15,000 **mercury bichloride** in normal saline solution, the tip withdrawn,

the joint emptied, and this procedure repeated for 15 minutes. The cleansing is assisted by flexion and extension, which brings out clots from remote recesses. After the irrigation, the synovial capsule is sutured with catgut No. 0 or 1—with avoidance of exposure of the catgut within the joint—and the fibrous capsule then sutured with a watertight lock-stitch. The outer wound is left open, an **alcohol dressing** applied, and over it a **pillow splint**. A slight reaction for a few days commonly occurs, following which the joint promptly returns to normal. Motion is allowed from the 10th day on. Many cases have shown good results under this procedure.

*Suppurative gonococcal arthritis* is much more common than is generally supposed, according to H. Mondor (Gaz. des hôp., Oct. 30, 1926). Puncture is alone reliable for its diagnosis. Many instances of "chronic rheumatism" are in reality gonococcic. Septicemic forms may be mild in appearance, but entail a grave prognosis. Puerperal arthritis is often gonococcal. In a case of multiple joint involvement, even with heart lesions, a careful examination for the gonococcus should be made before diagnosing rheumatic fever. **Synovectomy** is employed by H. Reynès (*ibid.*) in many cases of gonococcal arthritis. Performed early, it eliminates the focus from the start and obviates complications. The synovial membrane is excised *en bloc* with forceps and curved scissors through an external incision or, if required, both external and internal incisions. The tissues governing motion of the joint are to be spared in incising. After the synovectomy the wound is

at once closed, a silkworm gut drain being inserted, and motion instituted early. As a rule, rapid recovery follows.

**ASCARIASIS.**—In a boy of 6 years seen by A. Valerio (Brazil-méd., June 12, 1926), there were all the evidences of a grave meningitis, along with diarrhea, but all the manifestations passed off under treatment for helminthiasis. Both the vomitus and stools had shown ascarids, and the stools also contained tapeworm segments and trichocephalus. The case is reported as confirming the fact that ascarid toxins may cause convulsions and paralysis.

Pains about the umbilicus and material loss of weight had been experienced for 1 year in a young woman treated by Capecechi (Rif. med., June 28, 1926). **Laparotomy** revealed ascariasis as the cause of the disorder, and the use of **santonin** was followed by recovery.

**DIAGNOSIS.**—According to H. Brüning (Arch. f. Kind., Aug. 5, 1927), Fülleborn's *cutireaction* for ascariasis, carried out with an antigen prepared from pig ascarids, is diagnostically useful, having proved of service in over  $\frac{2}{3}$  of cases harboring the parasites and in over  $\frac{4}{5}$  of cases free of them. That *X-ray examination* may be of diagnostic value is illustrated in 3 cases recorded by Muzii (Policlin., Jan. 17, 1927).

**TREATMENT.**—The treatment of ascariasis with **oil of chenopodium** is discussed by Scharpff and Schneller (Münch. med. Woch., Apr. 23, 1926). In adults, they find, a 2-day treatment is required for satisfactory results. On the preceding evening the patient takes a light supper and an

active purge of **compound licorice powder, sodium sulphate, or castor oil**. If the purgation is inadequate, an **enema** is given. Next day at 7, 9 and 11 a.m., the oil is given in gelatin capsules of 6, 8, 10, 12 and 16 drops each, or in coffee. The noon meal consists of food leaving much residue, such as vegetables and salad, along with meat, and at 1 p.m. another active purge is taken. If defecation has not occurred by 5 p.m., castor oil, 1 tablespoonful, is taken, and if it fails, a copious enema in the evening. On the 2d day the same procedure is repeated. As the treatment is fatiguing, the patient stays in bed. In a full-sized man 16 drops of the oil of chenopodium 3 times a day are required, and this amount is harmless provided purgation occurs. Slight tinnitus, nausea and vomiting only occasionally resulted. The treatment should be given with the patient under close medical supervision. The result may be considered complete if no ova are found in the feces after 6 to 8 days.

**ASCITES.**—In regard to a relationship of the spleen or liver to ascites, E. Heller (Bull. Johns Hopk. Hosp., Oct., 1927) reports experiments indicating that neither of these organs represents a specialized area for the transfer of fluids into the peritoneal cavity. Fluids passing through the spleen and liver to the peritoneal cavity pass at least in part through the cytoplasm of the mesothelial cells.

A physical maneuver intended as a *test* for ascites is described by L. H. Kowitz (Deut. med. Woch., Oct. 15, 1926). The recumbent patient is made to raise himself to semi-recumbency by contracting his abdominal

muscles, without using his arms. If ascites exists, the wave of fluctuation caused by a tapping finger is more readily perceptible on the other side of the abdomen, as the tension of the abdominal wall increases the pressure of the ascitic fluid and thereby augments fluctuation. Even very small effusions can be detected with this procedure.

**TREATMENT.**—**Novasurol** was used by L. G. Rowntree, N. M. Keith and C. W. Barrier (Jour. Amer. Med. Assoc., Oct. 17, 1925) in 20 cases of ascites, due variously to cirrhosis, Banti's disease, neoplastic metastasis to the liver, polyserositis, etc. Novasurol used alone in certain cases gave striking results, but the best effects came from its use, intramuscularly or intravenously, in conjunction with **ammonium chloride** by the mouth, and a controlled diet of a fixed **low-water** and **low-salt** content. The novasurol was given in doses up to 2 c.c. (32 minims) at intervals of 3 to 7 days. Tolerance of it was 1st determined by giving 0.5 to 0.75 c.c. intramuscularly. The ammonium salt was given in divided doses up to 10 Gm. (150 grains) daily, in the crystalline form in capsules of 0.75 or 1.5 Gm. (12 or 23 grains). Diuresis resulted from this treatment in 19 cases, with increased excretion of sodium and chlorine in the urine. Ascites and edema in many instances resistant to other measures yielded promptly and completely, with results far beyond expectations as regards the tendency to recurrence. Where there was such a tendency, it was controlled by giving novasurol at intervals of 1 to 2 weeks or more.

Special stress has been laid by N. M. Keith, F. H. Smith and M. Whelan

(Arch. of Int. Med., Apr., 1926) upon the use of **diets of low mineral and water** content, not only in obstinate edema in nephritis, but also in persistent ascites due to hepatic or cardiac disease.

The patient to be treated is placed on a diet calculated to meet average basal requirements. The total daily fluid intake is 1400 to 1600 c.c., including 600 to 800 c.c. ingested aside from the water contained in the food. Such a régime meets the difficulty of those individuals who can excrete properly neither chlorides nor water. The diet may be varied in protein and caloric value with little increase in mineral or water content. No ill effects from its continued use were demonstrable.

L. Blum and P. Carlier (Presse méd., Feb. 25, 1928) offer further confirmation of the diuretic action of **calcium chloride** in hepatic cirrhosis. Prescribed as the dry salt in daily amounts ranging from 12 to 30 Gm. (3 to 8 drams), the chloride caused only slight ill-effects such as diarrhea and anorexia. In 1 case it proved definitely superior to the mercurial diuretics, including novasurol. To secure the desired effect from it, a **salt-poor diet** must be ordered, *e.g.*, 200 Gm. of milk a day, with potato, rice, fruits, eggs and meat. The administration of the calcium salt must also be kept up a sufficient time, as it is only on the 6th or 7th day that the body weight begins to diminish, while the ascites is reduced and the output of urine increases. No fear of acidosis through chloride retention need be entertained, for the ascitic fluid embodies an alkali reserve similar to that of the blood, which is available to satisfy the chloride ion

present. It is necessary, however, that the kidneys be functioning properly and able to excrete the excess of chlorine, otherwise evidences of chloride intoxication appear, *viz.*: dryness of the tissues, pinched facies, anorexia, acid eructations and vomiting.

*Myxedematous ascites* relieved by **thyroid** treatment is illustrated by H. E. Marsh (Amer. Jour. Med. Sci., Oct., 1926) by the report of such a case, in a woman of 37 years. The symptoms of myxedema had appeared 18 months and the ascites 6 months previous to her coming to the clinic. After withdrawal of 3 gallons of fluid the ascites gradually returned to almost its previous degree. The basal metabolic rate was found to be — 37. **Thyroxin**, 0.01 Gm. ( $\frac{1}{6}$  grain), was given intravenously twice at an interval of 3 weeks, and treatment then continued with **thyroid** by mouth, 2 grains (0.13 Gm.) 3 times and later twice daily. The ascites disappeared along with the other evidences of myxedema, and the basal metabolic rate rose to + figures. The hair, which had become gray at the onset of her trouble, began to resume its normal brown color. J. Fournier in 1925 had described 5 cases of myxedema with ascites and edema; in 2 of these, hydrothorax was also present. The 3 patients treated by Fournier himself were women between 25 and 40 years of age who had never been troubled with cardiac, hepatic or tuberculous affections. Administration of thyroid was always followed by marked diuresis and disappearance of the thyroid insufficiency and dropsy syndrome in 2 to 5 weeks. Whereas the action of thyroid on dropsy syndromes independent of hypothyroidia



is inconstant and temporary, that in myxedema is constant and lasting.

Four out of 5 cases in which Kehrer (Zent. f. Chir., July 17, 1926) operated for ascites by **anastomosis of the long saphenous vein with the abdominal cavity** turned out successfully, while in the 5th a slight local infection resulted in thrombosis. In a case of *hepatic cirrhosis* with marked ascites dealt with by Krestowsky (Paris méd., May 28, 1927), the **superior mesenteric vein was anastomosed with the inferior vena cava**. The ascites was so reduced that only 5 liters of fluid were withdrawn in 2 months, as against 15 to 25 liters each month previous to the operation. Subsequent development of a collateral circulation might cure the ascites completely.

**ASTHMA.**—The clinical recognition of *right ventricular hypertrophy* in bronchial asthma is not emphasized in most studies of the subject, according to M. H. Kahn (Amer. Jour. Med. Sci., Apr., 1927). The marked encroachment of the lung volume upon its capillary capacity, together with the varying intrathoracic pressure, constitute a decided strain upon the right ventricle, to which the organ responds by hypertrophy. The *electrocardiogram* is helpful in showing the relative preponderance of 1 side of the heart over the other. Complicating features, however, are hypertension and the existing amount of emphysema. Since left ventricular preponderance is an almost constant association of high blood-pressure, when, in a case of hypertension, there is no ventricular preponderance, one may assume the coexistence of right heart hyper-

trophy. Of 50 cases of bronchial asthma and emphysema, 10 showed right ventricular preponderance electrocardiographically. The other cases showed no preponderance and left ventricular preponderance in about equal number. Among these, a large proportion showed hypertension and aortic atheroma, masking the electrocardiographic evidence of right ventricular hypertrophy.

N. Ciancio (Brazil-méd., May 14, 1927, and Policlin., July 18, 1927) describes 5 cases in which asthma of long standing in children was recovered from after an attack of whooping-cough.

**ETIOLOGY.**—Of 160 asthmatics tested by A. H. Rowe (Arch. of Int. Med., Apr., 1927) with stock *house dust* solutions, 42 per cent. responded positively. Dust reactions were obtained in all age groups with the scratch test. The necessity of testing with a large number of stock and autogenous dust extracts was demonstrated. Many patients gave a characteristic history of dust sensitization. **Desensitization** to house dust extracts which give definite reactions in the individual patient is advisable where a marked history of dust sensitization is present. Reactions to dust rarely occur without 1 or more other reactions to proteins commonly used in testing.

According to F. Bezançon (Méd., May, 1927), neither the diathetic, nervous, nor the allergic theory of asthma alone will explain the occurrence of the disease. Respiratory tract lesions play an important rôle. Disorders in the nasal cavities or of the tracheobronchial glands, or syphilitic processes in the mediastinum, are well known causes. Lung fibro-

sis due to bronchopneumonia, war gas poisoning or, in particular, tuberculosis is an important etiologic factor.

Clendening (Jour. Kas. Med. Soc., May, 1926) states that attempts to prove cases of asthma due to chronic nasal disease to be hypersensitive to foreign proteins have failed. The relationship between the nasal and the bronchial conditions is not reflex, but probably characterized by direct infection from 1 to the other.

The following conditions were found by Muzzo (Arch. Chil. de ped., Sept.-Oct., 1926) to be primary causes among 35 cases of asthma in children: Tracheobronchial adenitis, 12; frank tuberculosis, 11; anaphylaxis, 6; exudative diathesis, 4; colitis, 3; congenital syphilis, 3; rickets, 2; persistent thymus, 1; hypothyroidia, 1; ovarian insufficiency, 1; adenoids and enlarged tonsils, 1.

According to L. Hofbauer (Berl. klin. Woch., July 23, 1926), bronchial irritation by direct air currents, on account of *impaired nasal breathing*, is a factor in asthma. X-ray examination of asthma cases showed the same congestion of the hilum as is seen in persons with obstructed nasal respiration. In conjunction with an irritable nervous system, this bronchial irritation leads to asthma. Asthmatics can generally prevent oncoming attacks by breathing through the nose when the typical premonitory sensation of oppression is felt. Complete avoidance of breathing by the mouth may obviate all further attacks.

Association of asthma with *pulmonary tuberculosis* is more common than is generally recognized, according to M. Lewison and E. B. Freilich (Ill. Med. Jour., Jan., 1927), who report

51 cases of this combination, all with tubercle bacilli in the sputum. The theory that patients with asthma do not have tuberculosis, and *vice versa*, is held disproved by their observations. A history of asthma in the family should be inquired for in obtaining a history of exposure to tuberculosis. Repeated sputum analyses every year should be made in asthmatics for the possible presence of tubercle bacilli. The most common symptoms besides cough, dyspnea and cyanosis, in asthma cases with pulmonary tuberculosis, are rapid pulse, loss of weight, pain in the chest, fever, nightsweats, and hemoptysis. Chronic bronchitis, asthma and emphysema, a common complex in elderly people, is frequently a result of tuberculous disease, and such persons should avoid intimate contact with children and infants.

Asthma in *pregnancy* is regarded by H. Offergeld (Zeit. f. Geb. u. Gyn., June 26, 1926) as the result of combined disturbances in the metabolism of salts, of isotonicity, and of the endocrin and nervous systems. Among available therapeutic measures are **mustard baths, hot foot baths, breathing exercises, chest massage, Kuhn's lung-section mask, suggestion**, and possibly **atropine** or **adrenalin**. When severe asthma sets in early in pregnancy, abortion is likely to occur, and **interruption of pregnancy** is advisable, in view of the danger of harm to the lungs or heart on account of the condition. Uterine evacuation in the early months of pregnancy in 11 cases on record uniformly gave satisfactory results. In the latter half of pregnancy, asthma is generally less severe and the fetus better able to withstand the disturbance. In a case

of irregular *menstruation*, dysmenorrhea, and asthma attending the periods in a girl of 16, all of these conditions disappeared together under *corpus luteum* therapy.

**DIAGNOSIS.**—An exhaustive history is of fundamental importance in the specific diagnosis of bronchial asthma, as stated by G. T. Brown (Jour. Amer. Med. Assoc., May 28, 1927). Various points to be considered in the *history taking* are as follows: The earlier in life asthma starts, the more likely it is to be due to sensitization, especially in the case of food. Animal epidermal and pollen sensitiveness also almost invariably begin before the age of 40. Asthma starting after 40 is usually due to bacteria. Occupation is important. In bakers, one is suspicious of wheat flour; grooms, horse dander; dairymen, cattle hair; farmers, any farm animals; druggists, powdered drugs, such as ipecac. A veterinarian or laboratory man may bring home on his clothing and hair enough animal emanation to cause asthma in a highly sensitive individual. A family history of asthma, hay fever, hives or eczema suggests sensitization, as does also a history of hay fever, hives or eczema in the patient himself. Eczema in infancy or childhood followed by asthma is very suggestive of food sensitization.

Seasonal asthma is generally due to pollen sensitization, occasionally to bacteria. Seasonal bacterial asthma is often limited to the winter months, but is also common in the early spring and late fall. As compared to pollen asthma, the bacterial cases are more irregular in the time of starting and stopping. Seasonal asthma may also be occasionally due to sensi-

tiveness to some seasonal food. Animal epidermal asthma may coincide with the molting season of animals. Relief by removal to another place has nothing to do with climate, but results from cessation of exposure to some substance in the home environment.

Skin tests should be made with every substance to which the slightest suspicion can be directed from the history, but not with every allergic substance on hand. Patients whose asthma began before 40 should be tested with all the substances they eat or come in contact with at least once a week during the period of the year in which they have asthma. If definite sensitiveness to some substance is found, this interval may be widened out to once a month, as there will likely be also sensitiveness to other closely related substances. Again, in asthma beginning after 40, testing with foods eaten daily during the asthma period usually suffices. Inquiry should be made for foods that may have at any time aggravated the asthma or disagreed in any way. Foods to which persons are sensitized may produce swelling of the lips or tongue, breaking out of the mouth, expectoration, itching or constriction of the throat, indigestion, nausea, vomiting, pain in the stomach or intestines, diarrhea, pruritus ani. Irritation of the eye and nose may also be caused, as in bakers or housewives who do their own baking. Only the protein in the food can cause sensitization; carbohydrates and fats merely produce digestive disturbance if taken to excess and thus permit protein to be absorbed undigested. Egg or wheat flour may be ingested in 1 of many dishes rather

than as such. Buckwheat is used at times as a filler in pepper; sweet potato, in the glue on postage stamps; cottonseed oil, in bought mayonnaise and some lard substitutes.

In addition to actual contact with animals, inquiry should be made as to which of the animal epidermals are present in the environment. Chicken, duck or goose feathers may be used in bed and soft pillows, mattresses and down comforts; horse-hair, in mattresses and pillows, overstuffed furniture, and as padding in clothing; cattle hair, in mattresses; goat hair, in mattresses, automobile and mohair upholstery, draperies and clothing; hog hair, in automobile cushions; cat and rabbit hair, in cheap dyed furs, and rabbit hair also in cheap mattresses and pillows, felt hats and children's toys; sheep wool, in blankets, comforts, mattresses, rugs and clothing; camel's hair, in antique overstuffed furniture, coats, hats and scarfs.

In bacterial asthma there is not likely to be itching of the eyes, which points to sensitization, and the nasal secretion is likely to be thick, sticky and frequently yellowish, in contrast to the watery secretion of the sensitive cases, though there may be a thin, watery secretion with a streptococcus infection. In the bacterial case the sputum is more likely to be greenish-yellow and purulent, there is much more cough and expectoration, cough generally initiates the attack, and the most common time for attacks is in the early morning hours, instead of at any time. Sensitive asthmatic attacks are usually more abrupt in onset. Bacterial asthmatics are usually more susceptible to sudden changes in the weather, are more sub-

ject to colds, sinus trouble, etc., and commonly say they never have asthma except when they take cold. In sensitive asthmatics an apparent cold and asthma may all develop within a few hours, whereas in bacterial cases it usually takes several days for a head cold to reach the bronchi and produce asthma. Bacterial asthmatics are much more likely to have hay fever with their attacks than are those whose asthma is due to sensitization to foods, animal epidermals or pollens, who usually have a subnormal temperature.

Pollen asthmatic patients usually give a history of having had typical seasonal hay fever 1 or more years before the onset of the asthma.

Under miscellaneous inhalants as a cause of asthma, orris root takes first place because of its use in face, talcum and tooth powders, sachets, and dry shampoos. Those sensitive to it are often definitely made worse by crowded places, such as theaters, ballrooms and street cars. Inquiry should be made for aggravation by house dust or any other substance in powdered form. Occasional causes of asthma are pyrethrum (in insect powders), kapok, and linseed meal, a common component of poultry feed. Patients sensitive to kapok are usually also sensitive to cottonseed.

F. M. Rackemann and D. S. King (Boston Med. and Surg. Jour., Aug. 19, 1926) state that the varying interpretations of skin reactions to *house dust extracts* account for the variation in the percentage of extrinsic (exogenous) asthma reported from different clinics. Thirty-six per cent. of all asthmatics show a skin reaction positive in some degree to house dust, but circumstantial evidence often points to a respiratory infection rather



than exposure to dust as a cause of the attack. Treatment of 95 asthmatics with **house dust extracts** produced good results in only 15. In spite of large doses of strong extracts general reactions with urticaria and asthma following treatment with dusts have not occurred in the writers' clinic. A diagnosis of bacterial asthma is clinically sufficient; the writers have not been able to demonstrate an actual hypersensitivity to bacteria.

Of 91 *children* with asthma and 9 with eczema, urticaria or angioneurotic edema tested by M. M. Peshkin (Amer. Jour. Dis. of Childr., Nov., 1927) by the scratch and intradermal methods with 33 proteins, 62 reacted positively to the scratch method and an equal number gave 1, 2 or 3 plus reactions with the intradermal method. The total of negative scratch reactions was 3032. The corresponding reactions with the intradermal method were definitely positive in 0.53 per cent.; 1 plus in 4.15 per cent., and negative in 95.32 per cent. The total of positive scratch reactions was 233. The corresponding reactions with the intradermal method were definitely positive in 19.31 per cent., 1 plus in 27.47 per cent., and negative in 53.22 per cent. From the standpoint of safety and of the determination of etiologic sensitizations, the scratch method would appear to be superior as a routine procedure, but neither method should be employed to the exclusion of the other.

#### TREATMENT. — Desensitization.

—This is regarded by A. Sterling (Ann. of Clin. Med., Dec., 1926) as the best method of treatment. About 15 per cent. of the cases, however, do not improve under it unless combined treatment, as by drugs or the X-ray, is also given. Again, in about 15 per cent. of hypersensitive patients, desensitization fails because of the

presence of some grave complication such as inflammatory changes in the respiratory system, cardiorenal disturbances, endocrin deficiencies, or pulmonary tuberculosis. Coke (Brit. Med. Jour., May 28, 1927) states that of 223 consecutive patients who had received desensitization treatment and replied to a letter of inquiry, 65 were free from attacks, 83 much better, and 44 not benefited.

As stated by G. A. Campbell (Can. Med. Assoc. Jour., Dec., 1927), **desensitization** of children suffering from asthma due to egg and horse dander is a practical and satisfactory method of treatment. Horse dander is probably the most important single cause of asthma in children. Cases of recurrent vomiting due to egg and milk are reported, some even fatal from acidosis. The writer refers to cases of asthma in children due to glue, canary feathers, mustard, hog hair, and flaxseed. Asthma of bacterial or non-protein origin is best treated by **vaccine**, but the results are not as spectacular as those in cases due to specific proteins.

**Exclusion of Allergens.**—Special chambers for this purpose have been devised, as for hay fever cases. Eighty asthmatics were treated by Storm, van Leeuwen and Kremer (Berl. klin. Woch., Apr. 16, 1926) by the use of special clean and airtight rooms to which cleaned air was supplied. Good results had already been obtained with this procedure in certain tuberculous patients sensitive to air-borne substances. The results in the asthmatics comprised a cure in 76 per cent., marked improvement in 14 per cent., and no improvement in 10 per cent. Elsewhere, Van Leeuwen (Münch. med. Woch., Apr. 9,

1926) describes the use, for asthmatics sensitive to substances present in houses, of small rooms with sterilized mattresses and the air obtained through a pipe extending some 10 meters (32½ feet) above the roof. Good effects were obtained by having the patients sleep in these chambers. For patients sensitive to air-borne allergens a feasible plan is to chill the air, whereupon the condensed water vapor embodies most of the air-borne allergens; the air is then warmed again and supplied to the patients.

**Calcium.**—Further data on this measure include a case reported by Casey and Pinning (U. S. Vet. Bur. Med. Bull., Aug., 1926) in which calcium injections were given with marked benefit. The patient also had emphysema and hypertrophy of the heart. Calcium was also effective in a case described by Schwarzer (Zent. f. Chir., Apr. 2, 1927), relating to a woman who suddenly developed dyspnea with stridor in pregnancy. The stridor being expiratory, asthma was diagnosed. Calcium completely dispelled the symptoms.

**Adrenalin.**—In a case recorded by Pagniez and Escalier (Bull. Soc. méd. des hôp. de Paris, Apr. 23, 1926), a woman suffering from frequent, refractory asthmatic attacks received in the course of 18 months no less than 2172 injections of adrenalin, each of 0.0005 Gm. ( $\frac{1}{130}$  grain). While apparently not affecting the blood-pressure, the drug was deemed the cause of such symptoms as pallor, rapid pulse and palpitations. Eventually some severe fainting spells occurred, and the adrenalin injections were discontinued.

**Ephedrine.**—Much attention has been paid to this new drug, which

allows of securing by oral administration much the same effects as result from injections of adrenalin. W. S. Thomas (Amer. Jour. Med. Sci., May, 1926) used it in 20 asthmatics, obtaining relief in all but 3, and deemed it an important substitute for adrenalin. MacDermot (Can. Med. Assoc. Jour., Apr., 1926) concluded that ephedrine yields well-marked antispasmodic effects in asthma, which last longer than those from adrenalin, and that it may be safely repeated over long periods. L. Pollak and Robitschek (Wien. klin. Woch., June 24, 1926) obtained favorable effects from oral doses of 0.1 Gm. ( $1\frac{1}{2}$  grams) of **ephedrine hydrochloride**, while Kämmerer and Dorrer (Münch. med. Woch., Oct. 15, 1926) noted that its effect was noticeable in 15 to 30 minutes after ingestion. The smallest effective dose was about 0.05 Gm. ( $\frac{3}{4}$  grain). The drug is ineffective in the presence of long-standing emphysema. Balyeat (Okla. State Med. Assoc. Jour., Jan., 1927) reported favorable results in 4 cases with **ephedrine sulphate** in doses of 0.025 to 0.05 Gm. ( $\frac{3}{8}$  to  $\frac{3}{4}$  grain) 3 to 5 times daily.

Compared to adrenalin, as stated by Althausen and Schumacher (Arch. of Int. Med., Dec., 1927), ephedrine acts more slowly and less completely, but more lastingly, and in most cases the disagreeable by-effects of adrenalin are avoided. Undesirable effects from ephedrine were, however, met with in the form of nausea, vomiting, nervousness, insomnia and palpitation in 30 per cent. of the writer's cases, and in 12 per cent. they were so severe as to necessitate discontinuing the drug. Some degree of tolerance to ephedrine was obtained

in at least 15 per cent. of the cases. Among 39 asthmatics and 12 *hay fever* cases, ephedrine controlled the attacks and, when used constantly, in many instances prevented them. Complete relief was obtained in 56 per cent. and partial relief in 24 per cent. Failure to relieve occurred in 8 per cent., and in 12 per cent. the marked untoward symptoms required cessation of the treatment. Taken by mouth the drug brought relief in 5 to 30 minutes, and hypodermically acted more promptly. Combination of ephedrine and adrenalin often caused marked untoward symptoms.

In the experience of R. Buendia (Rev. esp. de med. y cir., Jan., 1926), **liquid pituitary** in doses of 1 c.c. (16 minims) subcutaneously has permanently cured or greatly relieved asthma in 70 per cent. of the cases. Some of his cases had proven refractory to all other remedies, including adrenalin.

**Non-specific Therapy.**—**Peptone** injections were employed by Grezzi (An. de la Fac. de med. de Montevideo, July-Aug., 1927) in 7 cases of allergic asthma, with good results in all but 1, in which cardiopulmonary disease of long standing coexisted. That the drug acts by hemoclastic shock was shown by an urticarial exacerbation which promptly followed peptone injection. A. G. Auld (Brit. Med. Jour., May 7, 1927) reports favorably on intravenous injections of amounts of 3.5 c.c. (56 minims) of 5 per cent. **peptone** solution. The injections were administered, when indicated, as many as 16 times.

**Tuberculin** treatment is favored by T. Nelson (Pract., June, 1927). A skin reaction to pure old tuberculin is the best guide to the initial dose. About 0.5 c.c. of 1:1,000,000 dilution

is safe in this connection. Perseverance in treatment is requisite; an ordinary course of treatment occupies a year or even slightly longer.

Spoujitch (Presse méd., June 1, 1927) recommends the use of **diphtheria antitoxin**, injected subcutaneously in dosage such as to cause mild shocks, on the basis of his clinical trials in 13 patients suffering from asthma of 2 to 20 years' standing. He begins with an injection of 0.25 to 0.5 c.c. of the serum, and if no reaction occurs the next day, 2.5 to 5 c.c. are injected. Between the 5th and 11th days a reaction generally takes place. Thereafter, mild shocks with doses of 0.5 to 1 c.c. are given at intervals of 7 to 10 days for 2 to 3 months. The asthmatic paroxysms soon become attenuated and cease entirely for a period of 6 weeks to 13 months; if they recur, another course of injections is administered.

In 5 cases W. T. McBroom (Can. Med. Assoc. Jour., Apr., 1927) resorted to **blood transfusion**, with good results. The 3 younger patients—a child and 2 young men—were completely relieved and had no recurrences. They had failed to respond to all previous treatment. The 2 older patients were improved but not altogether freed of their trouble, probably on account of emphysema and damaged right heart. The transfusions were done by the direct syringe method, the therapeutic effect of unaltered blood seeming superior to that of citrated blood. Where there is a family tendency to asthma, an outside donor should be selected, from a family free of all hay fever and asthma. An endeavor should always be made to clear up foci of infection, and the patient's general

health, and especially his mode of living, should have careful attention.

For indirect **irritation therapy** Hekman (Ned. Tijds. v. Gen., Feb. 26, 1927) employs such agents as **milk, collargol, sulphur, tuberculin** and **turpentine**, and for direct irritation therapy, **autogenous vaccines**. He regards bronchial asthma as originally due to streptococcal infection of the smallest bronchi, and his most satisfactory results are secured by the use of **autogenous streptococcus vaccine** freshly prepared from the patient's sputum. In very weak children or old subjects, as well as in cases with circulatory or kidney disease, diabetes or congenital syphilis, the irritation method should be used with caution.

**Vaccines.**—Before applying vaccine treatment in asthmatics G. T. Brown (Jour. Amer. Med. Sci., Jan., 1926) goes thoroughly into the history for evidences of the bacterial nature of the condition, examines the nose and throat for the same purpose, and makes tests with stock bacterial proteins, using routinely *Staphylococcus pyogenes aureus*, *albus* and *citreus*, *Micrococcus catarrhalis* and *tetragenus*, *Streptococcus hemolyticus*, *non-hemolyticus* and *viridans*, pneumococcus Types I, II and III, Friedländer bacillus, diphtheroid bacillus, and *B. coli communis*. A von Pirquet test is made at the same time, and in case of a definitely positive reaction, the sputum is examined for the tubercle bacillus and the chest carefully examined, including X-ray study. The bacterial skin tests are washed off with sterile water after 30 minutes, and the patient returns next day for inspection for delayed reactions, which have all the appearances of a mild infection. These are the dia-

gnostically significant reactions, as the immediate definitely positive reactions do not seem to occur. Blood tests are also made. Where the leucocyte count exceeds 10,000 and the polymorphonuclears are around 80 per cent. or more, a diligent search for focal infection is indicated. A relative lymphocytosis suggests tuberculosis, lues, or a latent streptococcus infection, which should be ruled out. A Wassermann is made in all with a suspicious history and in all cases of continuous asthma (aortic aneurism). The writer does not find that eosinophilia in an asthmatic is practically diagnostic of protein sensitization.

Where all the studies above mentioned, together with skin tests for foods, animal epidermals, pollens, stock bacterial proteins, orris root, house dust, etc., fail to reveal any cause for the dyspnea, bacteria are assumed to be the cause. The patient now collects in a sterile bottle, when an asthmatic attack is breaking up, some thick mucus from his lungs, takes it promptly to the bacteriologist, who takes also cultures from the nasal secretion and throat. The various organisms found are isolated in pure culture and a vaccine prepared from each, containing 2 billion organisms per c.c. The vaccines are killed by heat and held several days for sterility tests; no preservative is used. The patient is tested intradermally with each of his vaccines, using sterile salt solution containing a trace of agar as a control. Sterile tuberculin syringes and fine needles (26 gauge, 1/2 inch) are used, and enough injected to produce a blister 1/4 inch in diameter. The patient returns next day for inspection. A re-



action  $\frac{1}{2}$  inch in diameter is called a + 1, and so on. Positive reactions in these tests are as common as positive reactions to skin tests with stock bacterial proteins are rare. Those vaccines which fail to show a reaction in 24 hours are discarded and those which react used for treatment.

If the test reaction was marked the initial dose is 0.025 c.c., or 50 million organisms; if moderate, 0.05 c.c.; if very slight or doubtful, 0.1 c.c. If several vaccines are to be given, they are all drawn into the syringe at once, with the dose of each the same as if it alone were being given. If, however, 1 vaccine has given a marked test reaction and another a relatively mild reaction, a small dose of the marked reactor is injected in 1 arm and a larger dose of the mild reactor in the other arm. A red spot 24 hours later the size of a dime or larger is called a local reaction. Treatments are given regularly every 5 to 7 days, preferably the latter. The 2d dose is usually double the 1st, and each time the dose is increased by the amount of the 1st dose, providing a local reaction is obtained. If any injection fails to give such local reaction, the next dose is increased by the amount of the 1st dose plus the amount of the previous increase. In the event of an extremely sore arm or a definite aggravation of the asthma, the next dose remains the same or is reduced to the previous dose. Treatments are continued until a maximum dose is reached or the vaccine is used up. Not more than 2 c.c. of vaccine is ever injected in 1 arm at 1 time. Out of 144 cases treated with bacterial vaccines by the above method, 51 per cent. were completely relieved of asthma, 39 per cent. improved in

varying degrees, and 10 per cent. unimproved.

**X-rays, etc.**—X-ray treatment has been employed by P. Vallery-Radot, P. Gibert, P. Blamoutier and F. Claude (*Presse méd.*, Oct. 5, 1927) in 64 cases, comprising 31 of asthma, 8 of paroxysmal coryza, and 25 suffering from both disorders. The attacks of asthma or coryza disappeared in 19 cases, or 30 per cent., and were improved in 16, or 25 per cent. More or less complete failure occurred in 29 cases. Some exposures were directed to the chest, others to the spleen. The exposures lasted 10 minutes and were given twice a week to a total of 10 or 12.

According to L. Gerber (*Radiology*, Sept., 1927) the X-rays are of value only in true bronchial asthma. Direct treatment of the chest and mediastinal contents is generally more effective than the indirect treatment applied over other organs, such as the spleen, treatment of which is best confined to obstinate cases.

S. G. Scott (*Brit. Med. Jour.*, June 5, 1926) favors an "X-ray bath" involving exposure not only of the chest but of all of the trunk. Not more than 10X filtered through 3 mm. of aluminum should be used.

**Ultraviolet ray** therapy proved useful in the hands of A. Bryce (*Brit. Med. Jour.*, Mar. 19, 1927) in a very severe case of spasmodic asthma, in 1 of asthma alternating with *eczema*, and a typical case of *protein sensitization*. The rays are valuable in increasing the absorption of calcium and phosphorus, thus alleviating spasm and leading to improved nutrition of the bones and nervous system. They also increase the iron in the blood and the hemoglobin, thereby reducing

the risk from dyspnea and asphyxia in asthmatics, and serve to enhance thyroid and adrenal endocrin secretion.

Of a series of cases of asthma and hay fever treated by W. G. Lewi (N. Y. State Jour. of Med., June 1, 1926) with **high frequency** electricity, 91 per cent. are stated to have derived satisfactory improvement from the treatment.

**Endobronchial Treatment.**—S. Kuh (Med. Jour. and Rec., Nov. 16, 1927) advocates the inhalation of a spray consisting of **menthol**, 1 to 2 per cent.; **creosote**, 1 per cent.; **camphor**, 0.5 to 1 per cent., and **oil of pine needles**, 2 per cent., in liquid petrolatum. Somewhat less than 1 fluidounce (30 c.c.) is the average amount inhaled. In bronchial asthma and severe *chronic bronchitis* particularly good results are reported.

**Miscellaneous.**—According to G. N. Jack (N. Y. State Jour. of Med., June 1, 1926), from 30 minutes to 2 or more weeks before the acute asthmatic attack there occurs a perversion of the body physicochemicals of the patient, manifested in pyuria, coated tongue, flatulence, indicanuria, chyluria, acidosis, occasionally glycosuria, and generally toxic, putrid and alkaline stools. Absorbed toxic substances lead to blood disintegration, and the resulting waste material is discarded at the place of least resistance in the asthmatic, *viz.*, the mucosæ of the head and air tubes. Treatment consists in elimination of the disintegrated material from the blood by **starvation**, the drinking of **hot water**, **castor oil** and **liquid petrolatum** in equal parts or **cascara**, and **diuretics** and **expectorants**. By diet and occasional use of **alkalies** the blood should be kept slightly plus in alkalinity. **Salt re-**

**striction** is indicated if there is a tendency to edema. Foods rich in **vitamins** or **chlorophyll** should be prescribed.

Daniéopolu (Presse méd., Dec. 2, 1925) considers that several factors are combined in the production of asthma. One is a local predisposition of the lung, whereby a reflex arc of parasympathetic type exists between the bronchi and the medulla oblongata. Abnormalities in the tone of the vegetative nervous system, due to local or general causes, are also of significance in the development of asthma. The general causes usually consist in changes in the content of amphotropic substances in the blood, while the local causes consist of a lesion in the lung or the extravisceral vegetative conduction paths. Besides, there is a cortical factor, *viz.*, the neuropathic predisposition very often observed in asthmatics and favoring recurrence of the attacks. All of the above predisposing factors lead to an attack only when an exciting factor, such as a local inflammation, psychic impression or anaphylactic shock, supervenes. That asthmatic shock once induced may continue even after the exciting factor has disappeared is accounted for in that the centripetal nerve-endings in the bronchi are irritated by the attack, this leading to a reflex spasm of the bronchi, which acts as a local factor in the production of further attacks. The treatment advised on the basis of these considerations consists in the daily ingestion of **calcium chloride**, 75 to 150 grains (5 to 10 Gm.), and of **quinine**, together with inhalations of **cocaine**, **morphine** and **iodine** to reduce the local excessive irritability of the bronchial nerves.

The anaphylactic factor should also be combated by means of **autosero-therapy**, **autohemotherapy**, and **tuberculin**. Local reflex causes such as intranasal disorders should be corrected. Lastly, in order to interrupt the sensory path of the parasympathetic reflex arc, the writer advocates **excision of the cervical sympathetic** and **division of all the nerve-fibers** coming from the vagus and recurrent nerves, of the vertebral nerve, as well as the rami communicantes between the inferior cervical ganglion, the 1st thoracic ganglion, and the 6th, 7th and 8th cervical and 1st thoracic nerves.

In a case of refractory asthma of 2½ years' standing reported by C. Mainini (*Semana méd.*, Feb. 18, 1926), the blood was eventually found to contain a few malarial parasites. Upon administration of **quinine**, within 6 days the asthma ceased, the plasmodia disappeared from the patient's blood, and the spleen was reduced to its normal size.

A note relative to the *prophylaxis* of asthma in children is sounded by M. M. Peshkin (*Amer. Jour. Dis. of Childr.*, June, 1927) on the basis of his observations of the influence of various infections in inducing asthma. A total incidence of asthma of 38 per cent. from such causes was noted in a series of cases, *viz.*, pertussis, 15 per cent.; acute pneumonia, 14; measles, 4; tonsillectomy and adenoidectomy, 3, and scarlet fever, 2. Measles, acute pneumonia and diphtheria had a temporarily beneficial effect on pre-existing asthma, while pertussis aggravated it. Chronic unresolved pneumonia was an etiologic factor in 2 per cent. Physical overexertion, indiscretions in diet—especially ice cream and iced liquids,—variations of

weather, the change of seasons, and exposure to winds and freshly painted rooms were important contributory factors in bringing on attacks, and deserve attention from the prophylactic standpoint.

**CARDIAC ASTHMA.**—Discussing the pathogenesis of this condition, S. Wassermann (*Wien. Arch. f. inn. Med.*, Jan. 5, 1926) recognizes 2 forms: (1) Cases in which aortic insufficiency and infarctions in the left ventricle are the main causes, leading to insufficiency of the left ventricle. Back pressure in the circulation (retrograde stasis) is not primarily concerned in this type. The attack of dyspnea is a reaction on the part of the medulla to anoxemia. The treatment calls for **morphine**, **oxygen** and **nitrites**. (2) Cases usually due to mitral stenosis, with blood stasis in the lungs. This type is featured by cyanosis; there is no acute increase in blood-pressure. In the treatment, **venesection**, **digitalis**, **caffeine**, **oxygen**, and at times **morphine** in small doses may be used.

The water metabolism has an important bearing on the production of cardiac asthma, according to F. Brunn (*Med. Klin.*, July 16, 1926). A **dry diet** or the giving of **mercurial diuretics** tends to prevent cardiac asthma, and an injection of **pituitary extract** will check an attack of it by preventing flow of fluid from the tissues into the blood.

A careful study of different types of respiratory distress arising in cardiac disease, with illustrative cases, has been contributed by M. H. Kahn (*Amer. Heart Jour.*, Apr., 1927).

**ATHETOSIS.**—*Double athetosis*, as stated by Bolten (*Ned. Tijds. v.*

Gen., June 4, 1927), is not to be confused with bilateral athetosis, but is a form of cerebral infantile paralysis. He reports such a case in a boy of 15 years, with spasticity of the lower limbs, flexed hip and knee joints, incoordinate asymmetrical involuntary movements, short spasms of the facial muscles, and agitated, irregular speech. The patient was intelligent. Disease in or close to the subcortical nuclei is probably at the bottom of this disorder.

**ATHREPSIA.**—According to Rohmer (Rev. franç. de péd., Aug., 1927), the only cases to be considered as suffering from true athrepsia are those in which digestive disorders give rise to the cachexia; this eliminates simple inanition and impairment of nutrition the result of infections. Most infants with true athrepsia can be cured. He describes 7 cases treated with **breast milk** and **buttermilk**, all recovering.

Of 58 cases of athrepsia and anhydremia studied by A. M. Alden (South. Med. Jour., May, 1926), 38 died. A definite infection outside of the intestinal tract was found in 56 instances, including especially otitis media, which existed in 51 cases. Other infections noted were pneumonia (18 cases), pyelitis, furunculosis, measles, chicken-pox, and congenital syphilis.

Encouraging results from the administration of **oxygen** were obtained by Botwood, Raper and Willock (Brit. Med. Jour., Apr. 18, 1925) in a group of cases of *infantile atrophy* in which treatment by diet, organ extracts and vitamins had failed. The diet was not changed qualitatively in conjunction with the starting of oxygen

treatment, but the amounts of foods taken were increased in proportion to the gains in weight and appetite of the patients.

**ATROPINE.—PHYSIOLOGIC ACTION.**—A study of the action of atropine on the *pulse rate* in 62 normal medical students is reported by D. Nicholson (Jour. of Pharm. and Exp. Ther., July, 1926). Sixty-one students showed an increase in pulse rate, averaging 39.31 beats per minute, after injection of  $\frac{1}{3}$  grain (0.002 Gm.) of the drug. Only 2 showed an increase of less than 15, and the entire range of increase was from 5 to 89 beats. One student showed a decrease of 12 beats per minute.

Several further investigations of the action of atropine in the gastro-intestinal tract have been reported. T. Rall (Zeit. f. d. ges. exp. Med., lii, 752, 1926), studying the effect of atropine on the *stomach* when given by mouth, in suppositories, or subcutaneously, observed that in sensitive subjects even 5 drops of a 1:1000 solution did not inhibit the gastric secretion, and that stomach motility was not diminished until as much as 20 drops had been administered. Subcutaneous injection of atropine had a more pronounced effect than its administration by the mouth. Suppositories had the same effect as the other 2 methods of administration, but produced less effect on the motility. In tests of the action of atropine on 27 subjects, H. Kalk and P. Siebert (Arch. f. Verd., June, 1927) found the amount of fluid and of chlorides in the stomach generally diminished, while the acidity was frequently increased. In therapeutics, the tone and motility, rather than the secretion of the stomach, are affected.

In regard to the *colon*, Lurje (Zeit. f. d. ges. exp. Med., May 25, 1926) observed, in experiments on cats, that relaxation of a spastic colon resulted when atropine was injected intravenously or subcutaneously. When introduced into the stomach or bowel, on the other hand, it had no effect on the tone or contractions of the intestine. The results were the same whether the connection of the loop under experimentation with the central nervous system had been severed or not. This observer recommends



that, therapeutically, atropine should be given either intravenously or subcutaneously, the former route acting the more rapidly where quick action is needed.

A careful study of the power of atropine to arrest milk secretion where it is necessary to suppress lactation because of intercurrent illness or for other reasons has been made by R. Stockman (Edinb. Med. Jour., June, 1927). Atropine,  $\frac{1}{100}$  grain (0.0006 Gm.), was given hypodermically, morning and evening, for the first 7 days after delivery in 52 cases. Among 17 primiparæ, in 15 the amount of milk formed after beginning the atropine was so small that it caused no discomfort and no more treatment was required. In 1 patient, the breasts became hard on the 3d day and a single dose of magnesium sulphate was given in addition. Among 35 multiparæ, all with plenty of milk, nursing was being avoided because of debility, death of the child, tuberculosis, anemia or nephritis. In 27 the mammary secretion was entirely arrested. In 7, enough milk formed to cause discomfort and to require 1 or more doses of magnesium sulphate. In 1 case, pyelitis with fever developed on the 7th day; nursing being stopped, atropine was given, but it failed to check the mammary secretion, and the breasts had to be exhausted. Thus, atropine, administered as described, is undoubtedly capable of arresting the flow of milk in most cases.

**THERAPEUTICS.**—In acute inflammations of the eye, atropine is generally stated to be of value by paralyzing the endings of the 3d nerve, thereby placing the ciliary and sphincter muscles at rest, and consentaneously paralyzing accommodation and dilating the pupil. According to F. H. Adler (Amer. Jour. of Ophth., Oct., 1926), while dilatation of the pupil prevents posterior synechiæ, there are cases practically not subject to synechiæ in which atropine nevertheless is of decided benefit. This suggests that there may occur some useful action of atropine other than those already mentioned. Earlier experiments had shown that atropine has a direct effect on the ocular blood-vessels, decreasing their permeability to protein molecules. This action would explain an effect of the drug in eye inflammations, for 1 of the cardinal signs of any inflammation is a leakage of protein from blood-vessels. A drug tending to prevent such leakage would allay inflam-

mation. Dionin, subconjunctival injections of hypertonic salt solution and oil of mustard having been found to increase the protein content of cats' eyes, the writer made quantitative determinations of the protein in a series of eyes in which these agents had been used, both with and without previous atropinization. The atropine was found definitely to check the increase in protein caused by these drugs. Hence an added valuable property of atropine in ocular inflammations.

In cases where the administration of atropine alone in effective dosage would prove inconvenient, a situation sometimes met with in gastric ulcer, gastric hyperacidity, bronchial asthma, chronic bronchitis, spastic constipation, membranous colitis, cholelithiasis, etc., R. Fischer (Berl. klin. Woch., Nov. 5, 1927) recommends giving the atropine in conjunction with pilocarpine. The atropine having been taken as usual, by mouth or subcutaneously, when disturbances appear with a daily atropine dosage of 0.003 Gm. ( $\frac{1}{22}$  grain), he gives the patient 15 to 20 drops of 1 per cent. pilocarpine solution in a glass of water and instructs him to take a swallow of it whenever his mouth feels dry or he has eye symptoms, in such manner that all of the glassful may be taken in the course of 24 hours. Disturbing symptoms are thus kept within readily bearable limits. If the dosage of atropine is increased, more pilocarpine may correspondingly be given.

In spastic constipation R. Goiffon (Paris méd., Dec. 12, 1925) uses a preparation of animal charcoal containing 0.0005 Gm. ( $\frac{1}{200}$  grain) of atropine per teaspoonful. The dosage is at first 2 teaspoonfuls a day, then 1 teaspoonful daily, and ultimately 1 or 2 teaspoonfuls a week. The results in the 7 cases reported were excellent, the atropine bringing on copious bowel evacuations without griping. The use of this atropinized charcoal was based on experiments by Wiechowski showing that substances absorbed by charcoal are released from it in the colon.

**AUTOCONDENSATION.**—According to Grover (Arch. of Phys. Ther., Mar., 1927), autocondensation in very mild dosage is beneficial in aortic aneurism, chiefly by causing an equalization of the

circulation, which relieves strain on the affected artery. Autocondensation is a valuable method of treatment in **acute alcoholism**. Some cases of **anemia** are benefited by local autocondensation over the solar plexus. Nearly all patients with the toxemia often known as **rheumatism** are improved by autocondensation. **Cold extremities** are benefited. Other conditions favorably influenced are **toxic headaches**, **insomnia**, **tabes dorsalis**, **angina pectoris** and **arteriosclerosis**. For the reduction of **high blood-pressure** autocondensation is an outstanding agent.

**AYERZA'S DISEASE.**—This disorder, not yet altogether recognized as a separate clinical entity, produces the so-called "black cardiac" subject, and is due to a sclerosis of the pulmonary arteries often proved syphilitic in origin and occurring as a sequel to a chronic bronchitis. The syndrome, which has only lately excited widespread interest, was described by A. Ayerza, of Buenos Aires, in 1901, as being featured essentially by chronic cyanosis, dyspnea, erythremia and pulmonary sclerosis. Escudero is said to have described the pathology in detail in 1905, although according to some his cases were of a somewhat different nature. In 1912 Arrillaga presented a detailed histologic study of Ayerza's disease and reported 11 cases. Since then a gradually increasing amount of attention has been accorded the syndrome, which has been observed not only in South America, but in Europe, the United States and India.

**SYMPTOMS.**—In the early stages, cough, expectoration and dyspnea are the main symptoms; then cyanosis and other manifestations marking the "cardiac stage" of the syndrome supervene. As described by G. Cheney (Amer. Jour. Med. Sci., July,

1927), the cough may precede the cardiac stage by 30 years. It is paroxysmal and increasingly productive. The sputum is mucopurulent and in time becomes abundant and often blood-streaked. Dyspnea increases insidiously, ultimately being present even during sleep. Cyanosis at 1st may be intermittent, occurring during bronchitic attacks, but later is constantly progressive, with striking exacerbations when the patient coughs, struggles for breath, vomits or has substernal pain. During cardiac decompensation it is so intense as to suggest the term "black cardiac." The blue color is most marked in the conjunctiva, ears, lips, nose and beneath the nails. Hemoptysis occurs, and may be copious. Somnolence is pronounced, the patient literally living to sleep and falling asleep while eating, although extreme dyspnea may cause insomnia. Vertigo is uncommon, and fatigue and palpitation are frequent early complaints. Angina, radiating out into the lungs, and accompanied by increased cyanosis, is brought on by exertion. Gaseous distention, epigastric pain and vomiting are common late symptoms. Headaches may be severe. Edema is usually a late occurrence.

As to the *physical signs*, the fingers and toes may be clubbed. The chest is emphysematous, the lungs hyperresonant, the areas of hepatic and cardiac dullness diminished. Inspiration is harsh, expiration prolonged and difficult, and sonorous and sibilant rhonchi are heard to a varying degree. An increase in the right border of heart dullness is present, the heart-sounds are distant, and the pulmonary 2d sound often accentuated; no murmurs. The liver is usually enlarged.

The pulse tends to be slow and of poor quality.

A cardinal feature is the erythrocyte count—usually over 5,000,000 and sometimes reaching 10,000,000. There may be a relative lymphocytosis. The blood Wassermann was positive in 6 out of 8 cases.

X-ray study shows the pulmonary artery forming a prominent shadow and an enlargement of the right heart. Secondary pulmonary congestion about the hilum has frequently led to mistaken X-ray diagnoses of tuberculosis or neoplasm. The electrocardiogram shows a slight to marked right ventricular preponderance.

**ETIOLOGY.**—The syndrome has been observed from the age of 12 years up to 55 years. Out of 27 cases, 15 were in males. The early period of chronic bronchitis and emphysema necessarily preceding the "black cardiac" condition is prolonged, lasting 25 years. Sclerosis of the pulmonary artery gradually follows the increased tension within this vessel, whereupon the peculiar symptoms of the disorder begin to appear. The cause of the sclerosis is usually or possibly always syphilis. Alcohol, malaria, smallpox and tuberculosis have been mentioned as causes, but their relationship is not proved.

According to E. Lenoble (*Arch. des mal. du cœur*, Apr., 1927), who reports 2 cases, in neither of which syphilis, malaria, or chronic alcoholism appeared in the history, the 2 causal factors are high blood-pressure and tuberculous infection. The thinness of the walls of the pulmonary artery lowers the resisting powers of this vessel and predisposes to degeneration of its coats.

**PATHOLOGY.**—At autopsy, as described by Cheney, lesions in the

heart, lungs and pulmonary arteries sufficiently constant to be diagnostic are found. The heart shows greatly dilated chambers and marked hypertrophy of the right ventricle. The lungs show the effect of chronic bronchitis and emphysema plus congestion, and not infrequently the presence of bronchopneumonia. The bronchi are dilated and show desquamated epithelium, atrophic muscle fibers, round cell infiltration, and fibrosis. Striking dilatation and sclerosis of the pulmonary arteries is seen. In the smaller ones, cell proliferation of the media and intima almost occludes the lumen, and the elastic fibers lose their normal parallelism and become interlaced.

**DIAGNOSIS.**—According to Cheney, the diagnosis of Ayerza's disease cannot be well assumed unless the clinical syndrome described by Ayerza is substantiated by characteristic X-ray and electrocardiographic findings and evidence of syphilis. The appearance of the patient, somnolence, erythremia, retinal congestion and unexplained cardio-respiratory embarrassment may be closely simulated by the Osler-Vaquez disease. Pulmonary sclerosis due to chronic infection or to anthracosis, or associated with asthma or even emphysema, may produce a picture identical with the "black cardiac." The 2 former conditions, however, can be distinguished by the X-ray, while clinical evidences of syphilis or a positive Wassermann would help differentiate the 2 latter. Ordinary arteriosclerosis of the pulmonary artery has long been recognized as secondary to mitral disease, emphysema, chronic bronchitis, adhesive pleurisy, tuberculous pulmonary in-

duration and synechia cordis, but the essential feature of Ayerza's disease is a primary sclerosis and endarteritis of the pulmonary arteries which apparently accounts for some of the more characteristic cardiac symptoms.

Escudero (Rev. Soc. de med. int., Buenos Aires, Nov., 1925) states that in the 1st stage of Ayerza's disease the chronic syphilitic bronchitis is distinguished from other bronchial affections by the marked polycythemia. The right ventricle is not dilated in this period. In the 2d stage there are present in addition sclerosis of the pulmonary artery, peribronchial sclerosis, and hypertrophy of the right ventricle and auricle, while the left heart and circulation in general are still unimpaired.

Brachetto-Brian (*ibid.*) advocates restriction of the term Ayerza's disease to cases in which each of the 2 stages is complete—the chronic bronchopneumopathy with marked polycythemia, and the chronic cardioangiopathy with absolute right cardiac insufficiency. Cheney (*loc. cit.*) suggests restriction of the term to those cases of pulmonary artery sclerosis and resulting right heart hypertrophy which are due to syphilis.

**PROGNOSIS AND TREATMENT.**—While some patients live for years even after entering the cardiac stage, the ultimate prognosis is bad. When the stage of cyanosis is reached, death is inevitable in about 3 years at the most (Escudero).

Cardiac incompetence may progress rapidly to complete decompensation and death from right heart failure, or the patient may simply sleep once too often.

In the early stages, **antisyphilitic treatment** may check the disease completely, but when the secondary sclerosis of the pulmonary artery has become established, only **symptomatic treatment** has so far been found worthy of attention. Symptomatic measures for the bronchitis and the cardiac failure are naturally in order. In a case reported by Cheney, **stimulations, warmth and phlebotomy** were instituted when he was seen in the final period of extreme weakness, but death occurred in deep sleep 29 hours after his admission to the hospital.

**AZOTEMIA.**—The *azotemic ratio* is defined by F. Nepveux and A. Hiernaux (Médecine, July, 1927) as the ratio of the urea nitrogen to the total nitrogen. In nephritis with azotemia, this ratio is increased in proportion to the quantity of urea that constitutes the nitrogen retained in excess. A reduction of the azotemic ratio through decrease of urea while non-urea material increases occurs in hepatic disease and in diabetes with impairment of nitrogenous nutrition. The severity of a morbid condition may be indicated by the azotemic ratio, which may thus assist in the formulation of the prognosis.



## B

**BACILLUS ACIDOPHILUS.**—

Further studies on the clinical value of *B. acidophilus* milk have been contributed by H. A. Cheplin (Boston Med. and Surg. Jour., Sept. 22, 1927). The experiments were conducted in 22 subjects and involved the preparation of 1800 liters of the milk and the bacteriologic examination of 490 stools. The cases comprised 18 of **chronic constipation and intestinal stasis** with the symptoms of "autointoxication," and 4 of **chronic diarrhea and mucous colitis**. In most of the cases the response was prompt and followed by complete regulation of the stools. In some cases results were not evi-

the action upon levulose, sucrose and maltose, and the surface tension test, as presumptive tests, and the actual ability to become implanted in the bowel to the exclusion of almost all other intestinal forms, as the confirmatory test.

An aciduric flora is antagonistic to a putrefactive flora. Whether aging of the tissues and arteriosclerosis of old age can be delayed by preventing intestinal toxemia, according to Metchnikoff's philosophy, cannot be stated from data now available. To transform the intestinal flora by feeding lactose alone requires persistent daily ingestion of 250 to 400 Gm. of the sugar.

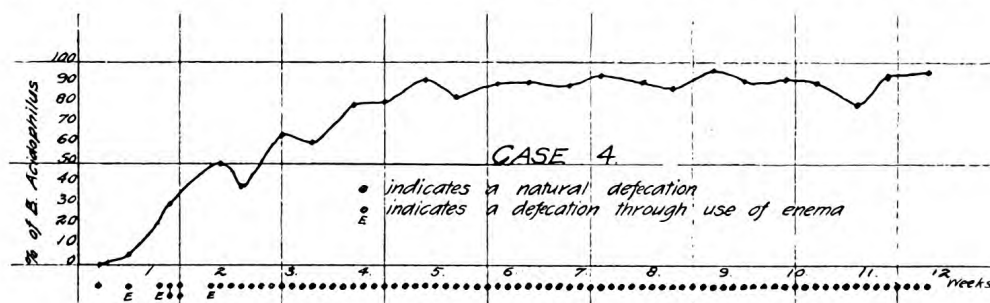


Chart of case of chronic constipation with typical symptoms of "autointoxication" treated by *B. acidophilus* milk and lactose. Complete regulation of bowel movements by end of 2d week, with relief from toxic symptoms. (Cheplin, in *Boston Med. and Surg. Jour.*)

dent at the start, but gradually increased, especially after the 6th week; in several, there was no benefit at all until after 5 to 7 weeks or even, exceptionally, 3 to 4 months. The slow response in each case was correlated with the extreme resistance to implantation of *B. acidophilus* within the intestine. Bacteriologic analyses of the stools should be made at regular intervals, particularly in obstinate cases, in order to follow intelligently the progress in the transformation of the fecal flora, and decide on dosage and duration of treatment. In the diarrheas and mucous colitis, the milk controls the discharge of mucus and transforms the stools into soft, light and well-formed dejecta.

Not all strains of *B. acidophilus* are equally adapted for intestinal implantation. The writer's recent studies suggest, as basis for selection of strains for therapeutic purposes,

Viable *B. acidophilus* cultures alone, or cultures reinforced with a little lactose, will yield similar results in less time. Frequently in obstinate constipation it becomes necessary to increase the dose—a fact disregarded of which accounts for many reported failures. The minimum average daily dosage should be 25 to 50 billions of viable organisms. In general, 500 to 1000 c.c. of the milk culture will represent the average daily dose. In the milder cases of constipation, diarrhea and mucous colitis, this dosage of the culture alone will suffice or may even frequently be reduced. For chronic intestinal stasis of long standing, the culture should be reinforced with lactose, 50 to 150 Gm. After the desired change in the flora and regulation of bowel movements has been achieved, the sugar and finally the culture can gradually be reduced. The culture should be divided in 3 or more portions

and taken preferably between meals so as not to interfere with the appetite. In the event of any objection to a gain in body weight, the consumption of other foods should be reduced.

**BACKACHE.**—Undue stress is laid on pelvic disorders as the cause of low backache in women, according to A. K. Paine (Boston med. and Surg. Jour., June 2, 1927). Backache, moreover, is not a consistent sign of any particular pelvic pathologic condition. Retrodisplacement is found in only 1 out of 10 backache cases. Commonly the cases of backache applying to the gynecologist for relief are of long standing. Usually the symptom is worse after exertion, especially toward night, with relief after lying down. A few have backache only when in bed, or persisting both day and night in equal intensity. Those with backache after exertion also often complain of low abdominal discomfort or pain, in 1 lateral quadrant or the other, sometimes sharp and fleeting, or dull and persistent. Flatulence commonly coexists. These patients have "hollow backs" and usually abdominal wall relaxation, are often round-shouldered, and apt to be undernourished. On the other hand, the patients whose backaches occur at night are apt to be overweight, short and thick-set, with no lumbar curves—a flat, square back with restricted motion in all directions. The former group of cases develop lateral flexions of the back easily when standing in the usual or most comfortable attitude. There is muscle spasm in the lumbar region, pronounced on 1 side, with the muscles often tender to palpation. The associated abdominal ptosis explains the vague but persistent complaints.

Palpation shows relaxation, a distended and sometimes tender cecum, usually at the pelvic brim; an easily palpable sigmoid, also usually tender; frequently a palpable liver edge, and occasionally the "floating" kidney. The beginning of the symptoms often dates back to child-bearing. This is because pregnancy brings abdominal relaxation and back strain from weight-bearing change; labor is a severe tax on physical strength, and a period in bed makes for acute muscular weakness. From this the patient gets up to greater exertion than before, the presence of the baby meaning longer hours on her feet, broken rest, more lifting and more housework.

Thus, a large number of the patients consulting the gynecologist for backache have postural faults. Teaching the patient to walk and stand correctly, regulated exercise to improve muscle tone, measures to lessen the fatigue of housework, etc., would doubtless cure the backache, but usually such measures are too time-consuming, and the necessary short-cut in treatment is the wearing of a corset, which must be laced in front, have straight sides to provide room laterally for some of the lifted abdomen, a well-boned high back, and a low-cut front, and be worn laced tightly at the bottom but very loose at the top. Worn properly, it will relieve muscle strain and lumbar backache, and materially lessen the symptoms due to abdominal ptosis and muscle strain. Proper corsetting practically relieves all of the cases having symptoms on exertion and relief on lying down. Some of the cases with backache only in bed are relieved by a proper corset worn in the

daytime; others, by procedures minimizing the extreme flexion these rigid backs are subjected to in beds with soft mattresses and relaxed springs. Failing relief by a corset in a seemingly postural case, the next consideration is that of a true arthritis, including that of the sacroiliac joint. The **knee-chest position** during several weeks assists in the treatment of the abdominal aspects of these cases. If relief again fails to occur, pelvic disorder may be reasonably held to exist. If displacement is suspected, **knee-chest packs** should be tried before resorting to surgery, for the backache which will yield to a suspension will almost invariably be temporarily relieved by the knee-chest treatment.

According to S. E. Ayers (*ibid.*, Jan. 6, 1927), *lumbosacral arthritis* is a much commoner cause of back pain than has been recognized. The lumbosacral joint, between a movable spine and a more or less fixed pelvis, is subject to considerable strain and injury. The most effective treatment is the production of an **ankylosis** in this region. Congenital anomalies of the 5th lumbar are not uncommon. *Sacralized lumbar vertebrae* are frequently the cause of persistent backache and can be relieved only by ankylosis. The approach necessary for a **fusion operation** in this region gives an excellent opportunity to examine the bony structure and should be done in selected cases in which the X-ray does not corroborate the physical examination. The operation is not accompanied by shock and is not dangerous when done properly. Lateral X-ray views of the lumbosacral region are essential in arriving at a diagnosis of low back pain. In

a series of 101 Hibbs fusion operations there was no mortality, and the results as regards relief from pain were excellent.

In 2 cases reported by F. Schultze-Rhonhof and H. Watermann (Zent. f. Gyn., Apr. 2, 1927) sacral backache ascribed by the patients to a gynecologic condition was relieved by **correction of flat foot**.

F. C. Hall (Med. Jour. and Rec., Feb. 16 and Mar. 2, 1927) stresses the fact that chronic backache is often, at least in neurasthenics, associated with *hypothyroidia*. Such cases are those which fail to respond to the usual treatment. They complain of excessive fatigability, usually have low blood-pressure, some dryness of the skin, especially of the lower legs, and in winter may show much chapping of the skin and often breaking of the skin of the fingers. The patients feel the cold excessively, often have a slow pulse and are sometimes overweight, and commonly show a congestion of the throat and often of the eyes. The metabolism readings are from -10 to -20, and the patients respond promptly to **thyroid** medication. The patients have soft, atonic muscles. In interpreting the metabolism reading it should be recalled that undernutrition itself can give a low metabolic rate. At least 2 metabolism tests on successive days should be carried out. The novelty of the 1st test to the patient is sufficient to give a reading higher than normal. In treatment, thyroid of known reliability should be used, beginning with  $\frac{1}{10}$  grain (0.006 Gm.) of desiccated gland substance twice a day, increasing the amount slowly, and checking the patient and his metabolism frequently.

**BACTERIOPHAGIA.**—Fairly numerous additional studies of this interesting phenomenon have been published, although the practical applications can hardly be said to have expanded in proportion. C. Prausnitz (Lancet, Sept. 10, 1927), in experimental work on the nature of the bacteriophage, used membrane filters of graded permeability, and was led to estimate the size of the phage corpuscle as being about that of collargol, *i.e.*, 20  $\mu$ . One phage corpuscle contains only about 400 molecules of protein matter. Two features which, so far as is known, are characteristic of living bodies were tested with reference to the bacteriophage; these were, random variability (incorrectly called "mutation") and variability in a definite direction, *e.g.*, in overcoming noxious influences. As for the former property, different bacteriophageal sub-filtrates, although derived apparently from the 1 original phagal strain, showed marked differences in their behavior towards anti-bacteriophage serum and towards disinfectants. Variability in a definite direction was illustrated in experiments showing that the bacteriophage could be completely accustomed to certain concentrations (1:10,000) of corrosive sublimate which at the outset had sufficed to destroy it. Similar experiments were carried out with phenol and chloramine. The facts elicited allowed of no more plausible explanation than that the bacteriophage is a living organism.

According to Eliava and Suarez (C. r. Soc. de biol., Feb. 25, 1927), the size of the bacteriophage corpuscle is not in excess of 0.005  $\mu$ . The number of particles of the antidyenteric bacteriophage was found to decrease during the course of ultrafiltration, but the particles remaining retained their virulence. Wollman and Suarez (*ibid.*, Jan. 14, 1927) found that the bacteriophage will pass readily through a filter impervious to hemoglobin and serum proteins, *viz.*, 1 consisting of collodion impregnated with 7 per cent. of acetic acid. That the bacteriophage corpuscles vary in size is shown by the fact that progressive reduction of the size of the pores of the filter causes a progressive reduction in the amount of bacteriophage in the filtrate.

E. Grasset (*ibid.*, Apr. 1, 1927) finds that upon injection of a filtrate of colon bacillus or staphylococcus bacteriophage into pregnant rabbits and guinea-pigs the bacterio-

phage can be found in the maternal blood but not in the blood of the fetuses. The bacteriophage is thus similar to toxins and anatoxins in being incapable of passing through the placenta, whereas antitoxins readily do pass through it.

D'Herelle (*ibid.*, Feb. 25, 1927), who was the first to attract widespread attention to the bacteriophage, has found that bacteriophagy is hastened when a current of air is passed, *e.g.*, through Petri dishes containing dysentery bacilli, staphylococci, plague bacilli or cholera organisms, and the corresponding bacteriophages. The virulence of the bacteriophages acquired on repeated passages is further increased by excess of air. This fact may with advantage be availed of in the preparation of large amounts of bacteriophage solution.

The manner in which the bacteriophage causes bacteria to break down has been investigated by J. da Costa Cruz (*ibid.*, Dec. 16, 1926). He finds that in living bacteria there is a special mechanism governing the passage of water and salts into the cell. The bacteriophage so injures the cell membrane that this mechanism breaks down and with it the bacterial organism. The effect of the bacteriophage is thus, in a sense, of a physical nature.

Flexner's antidyenteric serum was found by the same observer (*ibid.*, Dec. 10, 1926) to be incapable either of impeding the lytic action of the bacteriophage or of inhibiting reproduction of the latter. This fact is ascribed to adsorption of the antibodies of the serum by bacteria free of the bacteriophage. On the other hand, E. Wollman and Mme. E. Wollman (*ibid.*, Feb. 11, 1927) have observed that by using the bacteriophage itself as antigen a serum can be prepared which will interfere with the lytic action of the bacteriophage. Serum prepared with antityphoid bacteriophage was found to neutralize not only the lytic action of this bacteriophage on typhoid and Shiga bacilli but also that of the antidyenteric bacteriophage on these 2 organisms—in spite of the fact that the antityphoid bacteriophage has no effect on the bacillus of dysentery.

**THERAPEUTICS.**—A potent bacteriophage for practically all strains of *B. coli* isolated from urinary infections and for most of the other common Gram-negative



bacilli met with in human diseases was obtained by J. A. Caldwell (Jour. of Inf. Dis., May, 1927) from sewage filtrate. The use of sewage filtrate as a source of bacteriophage materially increases the number of **urinary infections** that can be treated with the bacteriophage and avoids confusion in the identification of resistant strains of bacteria.

An autolysate was prepared by Maslakovets and Kazarnovskaya (Mikrobiol. Jur., iii, 151, 1926; Jour. Amer. Med. Assoc.) by placing 10 c.c. of Shiga bacteriophage in 100 c.c. of bouillon culture containing 1500 millions of Shiga bacilli per c.c. This autolysate, injected intravenously in rabbits, immunized them against 10 lethal doses of dysentery toxin or of living dysentery bacilli. By immunizing horses similarly, the writers obtained a serum of such strength that 0.01 c.c. of the serum having the weakest titer was capable of neutralizing 7 or 8 lethal doses of dysentery toxin in rabbits and mice. A few patients with **dysentery** were treated with this serum, with encouraging results.

A. Ravina (Presse méd., May 1, 1926) refers to 17 cases of **colon bacillus urinary tract infections** in which a very active bacteriophage preserved in peptonized or slightly alkaline water was used. Both subcutaneous injections and bladder instillations of 32 to 48 minims (2 to 3 c.c.) of the bacteriophage suspension were employed. Two patients were cured, 8 cured or considerably improved, and 7 unimproved. Results with staphylococcal infections are still more favorable, *e.g.*, in **carbuncle, furunculosis, abscesses, and osteomyelitis**. Of 9 cases of staphylococcal urinary infections treated by Dalsace with an antistaphylococcal bacteriophage, 6 were cured bacteriologically and clinically, 1 relapsed after improvement, and 2 were failures. Local or general reactions occur only in weak subjects and are slight. The method is contraindicated in cases complicated with pyonephrosis or perinephritic abscess, and where tuberculosis is suspected. It is particularly indicated, on the other hand, in the **pyelonephritis of pregnancy** and in **chronic colon bacillus infections**.

**BALANITIS.**—Since the World War there has been increase in in-

fections caused by the spirochete of Vincent in the United States, as noted by M. A. Reasoner (N. Y. State Jour. of Med., July 15, 1927). Conditions predisposing to balanitis are lack of cleanliness and scanty use of soap. **Soap** applications suffice to destroy the surface organisms of this disease as well as those of syphilis and yaws. Vincent's spirochetes may exist in the apparently normal mouth or beneath a redundant foreskin without acute manifestations. With chronic mouth infection and the absence of a history, one would not be justified in considering erosive and gangrenous balanitis as necessarily venereal. The standard methods of venereal prophylaxis are equally effective in preventing erosive and gangrenous balanitis. The disease is particularly prone to attack lymphoid tissues and follows lymphatic channels. Except in an emergency it is not good practice to use arsphenamin in genital affections. The exclusion of syphilis may be more difficult and is more important than the diagnosis of erosive and gangrenous balanitis. It seems beyond question that the spirochete is the cause of the injury in Vincent's infections.

**BALANOPOSTHITIS.**—Two instances of *conjugal* balanoposthitis and vulvovaginitis are reported by F. Balzer (Prog. méd., Dec. 7, 1926). The prepuce became markedly swollen, with painful fissures which bled at every dressing. The condition finally yielded to irrigations with 2 per cent. **alum** solution and a 1:10 dusting powder of **tannic acid** and talcum. In the wife the condition had been aggravated by formalin, and yielded only to injections of **silver**

nitrate solution and later of liquor sodæ chlorinatæ (3 per cent. in water); ichthyol suppositories were also used. In the 2d instance, the wife had little in the way of symptoms, but the husband had balanoposthitis for some days after each coitus, for several years. Systematic injections of chlorinated soda solution yielded marked improvement. Refractory cases of balanoposthitis may probably be cured with bacteriophage corresponding to the pathogenic organism present.

**BALSAM OF PERU.**—A study of the antiseptic and antitoxic effects of balsam of Peru in wounds is reported by Brunner and Silberschmidt (Zent. f. Chir., Jan. 15, 1927). When introduced in skin-muscle wounds, along with earth containing lethal amounts of the bacilli of malignant edema and tetanus, it prevented death in 3 out of 4 guinea-pigs, and in the 4th, prolonged life so that a circumscribed abscess could be formed, which opened spontaneously. The amount of balsam used was 1 to 1½ c.c. (16 to 23 minims), and that of infected earth, 0.05 Gm. (¾ grain). In other experiments, the balsam was introduced into the wound 6 hours after the infected earth. Two animals survived. When the interval exceeded 6 hours, the balsam was without effect. The antitoxic action of the balsam was studied by introducing into a skin-muscle wound in guinea-pigs a fatal dose of tetanus or botulinus toxin, followed at once by the balsam. All the animals died, although death was postponed as long as 5 days. Lastly, a series of guinea-pigs received subcutaneous injections of balsam of Peru and toxin mixed *in vitro*. All thus dealt with survived.

**TOXICOLOGY.**—In a burn case treated with an ointment containing phenol and balsam of Peru, C. L. Cummer (Arch. of Derm. and Syph., July, 1927) observed an erythema and thickening of the skin under both axillæ, on the upper part of the right side of the chest, and elsewhere. Tests with the different ingredients showed that the balsam of Peru (6 per cent.) had been

responsible for the toxic dermatitis. It caused an intense local burning. From a review of literature the writer concludes that there is no doubt of the occasional irritating and toxic effects of the balsam, but that since the condition occurs but rarely, idiosyncrasy is probably responsible. Local injury usually appears as an eczematoid dermatitis, although 1 instance showed a morbiliform erythema. Absorption may take place after local application, and may result in severe toxic symptoms, fever, enteritis, nephritis, and even death.

**THERAPEUTICS.**—The utility of balsam of Peru in mastoid surgery is stressed by J. Leshure (Jour. Amer. Med. Assoc., Feb. 20, 1926), on the basis of 200 operations. At the completion of the operation, after the middle ear has been flushed through the aditus, he packs the wound tightly with a gauze pad saturated with a mixture in equal parts of the balsam and alcohol. This is removed in 1 to 2 minutes and serves the double purpose of sterilizing the wound and checking oozing. The wound is tightly packed with ½-inch gauze strips moistened with 1:5000 mercuric chloride solution and the balsam-alcohol mixture. Plain gauze pads moistened in mercuric chloride solution are superimposed, and over all, rubber tissue and the usual bandage. The first 3 redressings are made at 2-day intervals. The dressing described is strongly antiseptic, non-irritating, non-toxic, and agreeable in odor.

**BARBITAL.—PHYSIOLOGIC ACTION.**—Studies of the effects of the barbituric acid derivatives on the cerebral and the coronary vessels have been reported by C. M. Gruber and S. J. Roberts (Jour. of Pharm. and Exp. Therap., May, 1926). All of the derivatives tested caused dilatation of the cerebral vessels. Sodium-phenobarbital, 0.05 or 0.1 Gm., dissolved in Ringer's solution pH 7.6 modified by the addition of autogenous defibrinated blood to 20 per cent. and injected into a perfusate of the same fluid, caused marked cerebral vasodilation. In the brain, as in other organs, the barbituric acid derivatives act directly on the vessel wall in producing vasodilation. The benefit from phenobarbital in epilepsy may be due in part to its cerebral vasodilator action. Similarly, all

the derivatives tested in dilute solutions produced coronary vasodilation when injected into the perfusate of an isolated cat or rabbit heart. Concentrated solutions produced variable results. Iso-amylethylbarbituric acid, injected intravenously in saturated solution, materially lowered the arterial pressure in experimental animals.

In a comparative study of various hypnotics of the barbituric acid series in white rats, Nielsen, Higgins and Spruth (*ibid.*, Dec., 1925) were able to rank the derivatives in the order of their toxicity as follows: Barbital, neonal, dial, amytal, phenobarbital, allonal. In the order of increasing efficiency: Barbital, phenobarbital, neonal, dial, amytal, allonal. In the order of increasing margin of safety: Phenobarbital, barbital, allonal, amytal, dial, neonal.

**POISONING.**—While the margin of safety with barbital is fairly large, as stated by E. McC. Connely (N. O. Med. and Surg. Jour., Oct., 1927), the cumulative action is always to be guarded against and persons with an idiosyncrasy are not infrequently met with. The writer saw a patient go into active delirium after 5 grains (0.3 Gm.) of veronal, and a week later the same effect followed 1½ grains (0.1 Gm.) of dial. There is on record collapse and death after 10 grains (0.6 Gm.) of veronal.

Barbital addiction is not limited to the abnormal and the weakling, but occurs in more types than does addiction to any other drug except alcohol. Many people who would never think of taking opium or its derivatives will continue to use a supposedly "harmless non-habit-forming drug." Clinically, the mental symptoms usually overshadow the physical evidence. In the mild form the patient is vaguely restless, mildly depressed, emotionally unstable, unable to make decisions, obsessed with vague fears, shuns responsibility, is somewhat irritable, with insomnia, generally loss of appetite, constipation, and probably with tremor of the tongue and fingers; frequently there is dizziness. In the more advanced form, after prolonged use, the patients are depressed, markedly inactive physically and mentally, deteriorated, retarded, seem unable to express themselves freely, selfish and self-centered, with poor memory, worrying excessively, easily excited over trifles, becoming lachrymose on

slight provocation, and occasionally delusional. Physically they are anemic, with wasted, flabby muscles, easily fatigued, and frequently complain of palpitation. Ataxia is evident and there is marked tremor. The speech is hesitant, practically a stammer with a slurring drawl or rather more of a whine. Both mental and physical deterioration seem more rapid than with the opium derivatives. In the treatment, **gradual reduction** and thorough **elimination**, with precaution as to the patient's psychic reaction, are satisfactory in the mild cases. An aggravated case, in the writer's experience, is never permanently cured, usually being unwilling to expend the required effort.

In the case of a woman of 81 years reported by Schwartz (Schweiz. med. Woch., Apr. 2, 1927), 150 Gm. (5 ounces) of barbital had been taken in the course of 18 months on account of neurasthenia brought on by a cataract. Upon removal of the cataract and withdrawal of the drug the woman was found to have no craving for it and slept well without it.

A new manifestation of barbital intoxication, *viz.*, *multiple neuritis*, is described by H. Claude, Lamache and Daussey (Encéphale, June, 1927). This condition appeared in a woman who had taken 15 Gm. (½ ounce) of barbital and 5 Gm. (75 grains) of phenobarbital, and was featured by pain in the limbs and changes in the reflexes, including impairment of the Achilles reflex. Patches of dry gangrene on the right foot also occurred, and were ascribed to the neuritis, as no local circulatory changes were apparent.

**THERAPEUTICS.**—For the prevention of seasickness O. Bruns (Münch. med. Woch., June 11, 1926) recommends a dose of barbital as sedative, together with a meal ½ hour before the start of the sea voyage. Another dose may be taken 5 hours later, and a 3d the next morning. There should be some food in the stomach all the time. Recumbency on a deck chair near the middle of the ship is of advantage. If these measures fail, the writer injects ⅓ grain (0.001 Gm.) of atropine sulphate and applies slight constriction about the neck or a broad, tight band about the abdomen.

For **insomnia**, Hutchinson (Brit. Med. Jour., Oct. 31, 1925) deems the barbital group best among the more potent hyp-

notics. Most indications are met by barbital-sodium in doses of  $7\frac{1}{2}$  grains (0.5 Gm.). Phenobarbital is unnecessarily powerful for ordinary use, aside from exceptional circumstances.

**BARLOW'S DISEASE.**—See INFANTILE SCORBUTUS.

**BASAL METABOLISM.—APPARATUS AND TECHNIC.**—According to A. S. Jackson (Amer. Jour. of Surg., Jan., 1928), determinations of the basal metabolic rate made with a number of inexpensive outfits are misleading and of no scientific value. The Tissot gasometer has always given him absolute satisfaction. Much of the criticism of basal metabolic reports has resulted from inaccurate determinations made with poor machines. The greatest source of error is when abnormally high rates are reported in normal patients. Even a reliable metabolic unit may prove unsatisfactory unless the technician is qualified for the position. With the Tissot-Haldane method, the greatest accuracy is essential. The writer usually has 2 tests run, and the percentage of error must not exceed 0.51 per cent. If the patient has eaten, been exercising, has a cold, a sore throat, or fever from any cause, the test is not accurate. Likewise, unduly nervous persons may have a high rate. This error may be often avoided by first explaining the test to the patient and thus allaying apprehension. In considering the possibility of exophthalmic goiter, too much importance should not be attached to readings between +10 and +25 per cent. In toxic adenoma a rate between +20 and +30 must be considered significant. Whenever there is any doubt the test should be repeated 1 or more times.

The conditions prerequisite for basal metabolism measurements are expressed by F. G. Benedict (Boston Med. and Surg. Jour., Dec. 22, 1927) thus: The subject should have been without food at least 12 hours, and the last meal should preferably not have been too high in protein nor too excessive in calories. (A sojourn under surveillance for 12 hours before the test may be desirable with careless or untrustworthy subjects, in order to insure absence of food in the alimentary tract at the time

of the experiment). There should be a preliminary period of rest of not less than 30 minutes, during which the subject should be lightly covered with a blanket, if necessary, to insure comfort. There must be complete muscular repose during the test, including absence, in so far as possible, of all muscular tension. There should be absence of psychic activity. The temperature, at least in the mouth, should be within normal limits, and the subject preferably kept awake.

Benedict (*ibid.*) describes in detail a small, light-weight "field respiration apparatus," developed particularly for studying the metabolism of remote races, *i.e.*, sufficiently portable to be actually of use in field work. The apparatus, while proven capable of giving accurate results, is so simplified and standardized that it permits of determination of the oxygen consumption (apparent volume) with but 1 major measurement, *viz.*, the time required for the absorption of 6 pumpfuls of oxygen. The principle is the same as with the student respiration apparatus described by Benedict and Mrs. Benedict in 1923. The subject breathes through a rubber mouthpiece into a closed circuit of oxygen-rich air. This closed circuit consists of a metal can partly filled with soda-lime for the absorption of the  $\text{CO}_2$  produced and covered with a light-weight rubber bathing-cap for the expansion and contraction of the air during respiration. The oxygen consumed is replaced from a rubber bag, *vis.*, a basket-ball bladder, containing oxygen. The oxygen is saturated with water vapor, and is then metered through a pump of known and constant volume of stroke. The test begins and ends with the bathing-cap at a definite degree of distention, and the oxygen introduced during the experiment is thus a measure of the oxygen consumed by the subject. The closure of the piston on the pump is of a new type, insuring absolute tightness. Constancy in the length of stroke of the pump handle is secured by metal-to-metal contacts. A simple oxygen generator is also described, whereby oxygen may be generated from a commercial preparation of sodium peroxide when cylinders of the compressed gas are not obtainable.

Before determining the basal metabolic rate C. M. Guion (Med. Woman's Jour.,



June, 1926) requires the subject to have had 12 hours in bed at complete rest, no food for 14 hours, and only 1 cup of caffeine-free coffee or 1 glass of water at least 2 hours before the test. The subject should be dressed and taken to the laboratory with the minimum of exertion. At the laboratory the top clothes and shoes are removed. If possible, a trial run of the test is made to demonstrate it and relieve apprehension, before the 30-minute rest. In the test, 3 or more trials of 6 minutes each are run. Consecutive readings should not vary more than 5 per cent. If possible, duplicate runs should be made on different days. In interpreting the readings one should realize that each individual has a characteristic normal metabolic rate, subject to variation like the pulse-rate or blood-pressure. The rate varies with the physical and mental condition, *e.g.*, with illness, fatigue, nervous and muscular tension. As to menstruation, the 2d and 3d weeks are the optimum time for the determination. Different laboratories and technicians vary to such an extent that it is important for each to establish his particular variation from normal by making repeated readings on normal people; the norm for the individual laboratory should be stated on reports. Every few months the norm should be checked up by using the individuals previously tested.

In a study of the basal metabolism in a large series of persons, healthy or ill, Bornstein and Völker (*Zeit. f. d. ges. exp. Med.*, Dec. 9, 1926) observed daily rhythmic changes in metabolism, independent of bodily motion or sleep.

**CLINICAL FINDINGS AND APPLICATIONS.**—Basal metabolism in the elderly was investigated by Legrand (*Rev. franç. d'endocrinol.*, June, 1926) in subjects 62 to 82 years of age, comprising 12 men and 9 women. In comparison to the metabolic rate in persons of 30 to 50 years it was reduced in all, a condition which the writer ascribes to diminished influence of the thyroid gland on metabolism in the elderly.

In periods of *physical training* the basal metabolic rate was found by E. C. Schneider, R. W. Clarke and G. C. Ring (*Amer. Jour. of Physiol.*, July 1, 1927) to decline in 3 subjects and remain unchanged in 2. The basal minute-volume and frequency of breathing were not affected. Training

slowed the basal and early morning standing posture pulse-rate, but did not affect the early morning arterial blood-pressure.

The greatest clinical interest in the basal metabolism relates, of course, to thyroid disturbances. A. S. Jackson (*Amer. Jour. of Surg.*, Jan., 1928), recording an analysis of 3085 reports, states that, except in the case of *myxedema*, little significance is attached by him to the reports except for the purpose of eliminating *hyperthyroidism*. Before attempting to interpret the results of metabolic studies the surgeon should be thoroughly versed in clinical thyroid disease. In the *adenomatous* form of *goiter* the metabolic rate is of great diagnostic value in determining whether or not the goiter has become toxic. If the rate is +25 per cent. and the patient unduly nervous a 2d test may give a normal reading, but even a single test with a reading higher than +30 usually indicates hyperthyroidism. In toxic adenoma the rate rarely exceeds +65. When it exceeds +50 the writer studies the patient again to consider the possibility of superimposed exophthalmic goiter. If there is any doubt, iodine should be given, causing improvement in exophthalmic goiter but not in toxic adenoma. A patient may be almost dying from toxic adenoma yet have a rate of only +30 or 40. The rate is not an index of the degree of cardiac involvement, and in no sense a criterion of the risk of operation. In a number of cases of *iodine hyperthyroidism* observed, often the rate did not exceed +30, and by promptly withdrawing the drug, giving mild sedatives and advising rest it was possible to abort the symptoms; in other cases, however, the rate was as high as +65, and in 3 instances death took place in spite of all medical measures.

In *exophthalmic goiter* the metabolic rate gives valuable data regarding the result of the pre-operative treatment, that of operation, and the prognosis. In any case, when considering the possibility of exophthalmic goiter, unless the clinical symptoms are clear-cut, too much importance should not be attached to readings between +10 and +25. In a case of chronic, mild, low-grade exophthalmic goiter, with the diagnosis uncertain at first, the metabolic rate of +30 neither confirmed nor refuted the suspected diagnosis. Under iodine as

therapeutic test the rate remained +25. But later, following a hot spell, the rate jumped to +46; the patient seemed keyed up, her appetite became excessive and she began to lose weight. After 3 weeks' preparation with iodine the rate fell to +14, and at operation a rather large friable hyperplastic thyroid was removed. In the case of a woman aged 30 who, after illness in the family and childbirth, lost 35 pounds and showed weakness, great nervousness, slight prominence of the eyes, palpitation on exertion, dyspnea, symmetrical thyroid enlargement with questionable bruit, warm skin, slight tremor, and pulse-rate 96, the possibility of thyroid disease was eliminated by a normal metabolic rate of +6, and marked improvement followed cessation of lactation, with adequate help and rest. Another patient, 58 years old, had general tremor for 2 weeks, a pulse-rate of only 78, with increased pulse-pressure, considerable fatigue and nervousness; a metabolic rate of +56, rapid improvement under iodine, and the finding of a typically hyperplastic gland at operation confirmed the diagnosis of exophthalmic goiter. The metabolic rate may be +80 in a person who has recently passed through a crisis; the rate may be falling and the patient improving. This rate is of less significance than one of +50 in a person on the verge of a crisis, in whom the disease is progressing rather than subsiding.

The average metabolic rate in various forms of goiter before and after treatment is given by Jackson thus:

Type	Cases	Basal Metabolic Rate		
		On Admission, Per Cent.	After Administration of Lugol's Solution, Per Cent.	After Operation, Per Cent.
Exophthalmic goiter .....	1059	+57	+37	+6
Toxic adenoma	545	+32	....	+4
Non-toxic adenoma....	513	+6	....	+2
Colloid goiter.	188	+3	....	....
Iodine hyperthyroidism..	114	+35	....	+4

According to A. Lyall (Brit. Med. Jour., Apr. 28, 1928), the experimental error in the ordinary method of determining the basal metabolic rate is about +8 per cent., but

the error tends always to be toward the upper side. Thus, a rate of +10 is within normal limits, but a rate of -5 shows a degree of reduction upon which one is entitled to place diagnostic importance. Out of 45 cases of *exophthalmic goiter* 9 had rates exceeding +60, including 4 with +87, 97, 100 and 105, respectively. Those above +60 make poor surgical risks. Those classed as mild by estimation of basal metabolism are likely to become good civil lives within a reasonably short period of medical treatment alone. Among 11 cases of *myxedema*, the rate ranged from -3 to -42, and averaged -14. In *puberty goiter* the rate is not increased. The rate estimation has not been found of value in the diagnosis of malignancy of the thyroid. It is of value in the control of treatment, especially by the X-rays.

Adults showing *undernutrition* or *inanition* have, as stated by W. S. Wyatt (Ky. Med. Jour., Feb., 1928), a metabolic rate below normal, while infants and children with the same condition show a slightly increased rate. In *exogenous obesity* the rate is within normal limits in 81 per cent., while the remainder show rates between -15 and +15. In *endogenous obesity* the rate is within normal limits except in those patients examined during or soon after the growth period, when a distinct diminution in metabolism is found. In *Addison's disease* some cases show a decided increase, some a normal and some a diminished rate. Absence or diminished function of the *testes* or *ovaries* only rarely causes a lowered metabolism. In spite of all the work done on the influence of *menstruation* on metabolism, the subject is still not settled. During the early months of *pregnancy* the metabolism is lowered; then it increases gradually, rising out of proportion to the gain in weight, until a few days before delivery it is above normal. Following parturition it may remain stationary for a short time or show a rapid drop, slightly rising in the next few weeks. The acute cases of *secondary anemia* show an increased rate, the milder cases are usually within normal limits, while the chronic ones tend to show a diminished rate. The majority of cases of *pernicious anemia* show an increased rate, others a decreased metabolism. In the *leukemias* the basal metabolism may

be as high as in the severe types of Graves's disease. Minot and Means have proved that leukemic and exophthalmic goiter patients with the same metabolic rate have about the same pulse rate. *Erythremia* shows a rather uniform increase of metabolism. *Fevers*, according to DuBois, give metabolic rates of the same degree, the average rise being about 7.2 per cent. for each 1° F. In *pulmonary tuberculosis*, however, the metabolism tends to be relatively lower than with corresponding temperatures in other infections; this is thought due to the fact that pulmonary tuberculosis is often accompanied by high fever with relatively slight toxemia and little or no toxic destruction of protein.

According to F. Suan (Prog. méd., July 18, 1925), the basal metabolic rate is unstable, and frequently increased, in *tuberculosis*. Signs of hyperthyroidism being frequently observed in patients applying for treatment at tuberculosis dispensaries, the problem of differential diagnosis between the 2 conditions arises in many cases. Again, the thyroid function may be increased through toxic irritation in the course of pulmonary tuberculosis. According to Cordier, in incipient lung tuberculosis an abrupt rise of the metabolic rate at the start of an acute exacerbation is of grave prognostic import.

B. Schick and P. Cohen (Amer. Jour. Dis. of Childr., Sept., 1925) find that many patients with acute infections have a low basal metabolism in the *post-infectious state*. This usually lasts for a few days, sometimes for a few weeks. Two patients with *meningeal conditions* had a low basal metabolism for weeks, coincident with a low pulse-rate; in the 1 case well studied, the metabolism and pulse rose to normal simultaneously. The writers usually found a correlation between the pulse and metabolism. A slow pulse is a good clue to the finding of a low metabolism, especially if the heart is of normal size. The slow pulse in post-infectious states, of certain brain diseases, and of icterus is caused by a low basal metabolism and not by a stimulation of the vagus, at least in most instances.

Basal metabolism was found increased by +8 to +30 in 8, decreased by -10 to -21 in the same number, and normal in 14 out of 30 cases of *heart, kidney or arterial dis-*

*ease* by M. R. Castex and M. Schteingart (Prensa méd. Argent., Feb. 10, 1928). In heart weakness or failure the rate generally rose. In nephritis either with or without edema, the rate was lowered and thyroid medication proved beneficial.

A special syndrome combining *diastolic hypertension* and increased basal metabolism is described by E. P. Boas and S. Shapiro (Amer. Heart Jour., June, 1926). This condition should be distinguished both from exophthalmic goiter and from uncomplicated hypertension.

According to Sterling-Okuniewski and Wegierko (Paris méd., Sept. 10, 1927), basal metabolic determinations in cases of *renal disease* are of little diagnostic value, though affording indications for treatment. In a majority of cases of azotemic nephritis with high blood-pressure the metabolic rate was found increased, while in some patients with chloridemic nephritis it was somewhat decreased. Essential hypertension and high blood-pressure due to kidney disease cannot be differentiated by the basal metabolism, which in either instance may be increased or normal.

D. L. Drabkin (Jour. of Biol. Chem., xl, 68, 1926) finds that the output in the urine of the normal *urinary pigment*, urochrome, is directly proportional to the basal metabolism, as calculated from the surface area, in the rat, dog and man. He was able markedly to increase the output of pigment by augmenting the metabolic rate with thyroxin. In 10 exophthalmic goiter patients a distinct parallelism of the metabolic rate and an increase in urinary pigment output was verified. In several, after thyroidectomy, the pigment fell to the normal or even somewhat below it. In a case of leukemia, a similar relationship was observed. During the pyrexia stage in 3 cases of pneumonia the pigment output was above normal.

Studying the basal metabolism and the specific dynamic action of *foods in children* in various conditions of nutrition, A. F. Morgan and G. D. Hatfield (Amer. Jour. Dis. of Childr., Oct., 1926) observed an apparent lowering of metabolism in the spring as compared to the winter. Of 6 children overweight for height and age, 3 showed abnormally low metabolism, 1 was +9, and 2 were normal. Four boys aged

10 years, 2 distinctly overweight and 2 of normal weight, were tested for increase in metabolism following carbohydrate and protein meals. More than twice as much increase was noted after the protein than after the carbohydrate meal, but only small and irregular differences between the increases shown by the overweight and normal boys were obtained.

An increase in metabolism by over 60 per cent. was witnessed by Rietschel and Strieck (Zeit. f. Kind., Feb. 14, 1927) in adult subjects upon ingestion of 10 Gm. (150 grains) of *sodium chloride* in 20 c.c. (5 drams) of water. Ingestion of a sufficient amount of water at the same time prevented this effect. In infants the rise in rate from the salt was even more marked. The writers believe the toxicosis of infants to be merely an expression of thirst.

E. Casteran (Rev. méd. Lat.-Amer., Nov., 1927) found the metabolic rate — 15 in 24 patients with *paroxysmal rhinitis*, though between the attacks there was a rise of as much as 30 per cent. In 15 cases of *osena* and 10 of *otitis* with bone involvement the metabolic rate was from — 10 to — 25. These observations are regarded by the writer as suggesting an endocrin factor in these disorders.

Estimating the basal metabolic rate in 10 ichthyotic children and 7 adults with mild *ichthyosis*, A. Porter (Brit. Jour. of Derm., Dec., 1926), found it subnormal in 70 per cent. of the children and in 25 per cent. of the adults. It was as low as — 33 in several children. The lowness of the rate did not, however, always correspond to the severity of the case. As the thyroid normally becomes more active at puberty, any existing hypothyroidia would be expected to be partially compensated for after adolescence. Of 6 clinically normal mothers of ichthyotic children, 4 had increased metabolic rates and only 1 a decreased rate. Of 12 ichthyotic cases treated with thyroid, 8 improved, and of these 8, in 7 the rate was subnormal and in 1, normal. No case with the rate above normal showed definite improvement, and those having the lowest rates showed the greatest improvement.

**BEE STINGS.**—Bee poison, as described by R. W. Jones (Northw.

Med., Oct., 1926), contains both a powerful local irritant, *viz.*, formic acid, and a general body toxin. The reactions resemble anaphylaxis and foreign protein poisoning. In sensitized individuals, bee sting produces the same initial suffocation and bursting feeling as anaphylaxis and later the localized swelling, subcutaneous hemorrhages and heart weakness of foreign protein poisoning. A beekeeper gets enough bee poison to be immune, but the other members of his family, only enough to be sensitized.

**Desensitization** to bee toxin has been proven feasible by Braun, who prepared a toxin by grinding the rear  $\frac{1}{8}$  of bees' abdomens in salt water and filtering, and standardized it by tests on a sensitive skin. Desensitization is effected by injection of ascending doses, beginning with an amount much less than a bee introduces when stinging. The method is applicable, however, only in selected cases, as the preparation of the toxin is a big task and the desensitization a relatively painful procedure. **Adrenalin** hypodermically is a specific for the general body reaction to the bee sting. Injected locally where the wheal forms, it retards the swelling but does not relieve the pain, as usually the needle and adrenalin hurt more than the bee sting.

**BENZOATES.**—*Ammonium benzoate* was found clinically by J. M. Johnston (Edinb. Med. Jour., Apr., 1927) to produce or maintain an acid urine. Some alkaline cloudy urines rapidly clear under this salt, with relief of symptoms, but in obstinate cases of **chronic cystitis**, especially in women, it merely prepares the way for methenamine, the combination of the 2 drugs affording good results. When the urine in **colon bacillus cystitis** is acid, relief is increased by alkalinizing with sodium bi-



carbonate before the benzoate is given. In giving ammonium benzoate in cystitis, the 1st effect is a moderate diuresis, which is maintained and no doubt plays a part in the effect by flushing the urinary passages. That ammonium benzoate has an antiseptic action is doubtful; it is not to be relied on clinically when used alone.

**BENZOL.—POISONING.**—L. Greenburg (Pub. Health Rep., July 2, 9, and 23, 1926), reviewing studies conducted by a special Subcommittee of the National Safety Council, notes that out of 23 establishments canvassed having 10 or more employees exposed to benzol poisoning, 8 were rubber factories, 5 chemical works, 4 paint and varnish makers, 3 gas plants making benzol as by-product, and 3 plants of other types. Of 17 firms with 10 to 49 employees exposed, 6 had experienced cases of poisoning. All workers exposed to benzol should be given a thorough medical examination before employment, and none employed who show signs of organic heart, lung or kidney disease, hemorrhagic tendencies, anemia or any unusual blood-picture. Monthly reexaminations, with blood counts, are indicated, and a worker showing any of the following symptoms should be promptly excluded from benzol exposure: Hemorrhages from mucous membranes; decrease in the white blood cells of 25 per cent. below previous examinations, or in any case of leukocyte count below 5000; decrease of 25 per cent. in the red cells, or hemoglobin below 70 per cent.

The order of toxicity of benzene (benzol) and its homologues is, according to experiments by Batchelor (Amer. Jour. of Hyg., May, 1927), as follows: Benzene, toluene, xylene and high-flash naphtha. Benzene, however, possesses special toxic properties on the nervous system and blood-forming organs which are almost wholly lacking in the other solvents named. Winslow (Jour. of Industr. Hyg., Feb., 1927) urges that manufacturers using benzene give serious attention to the substitution of the homologues or other relatively harmless substances for benzol wherever possible.

**SYMPTOMS.**—In *acute poisoning* by inhalation the symptoms, as described by Greenburg, are faintness, dizziness, excitation, pallor and later flushing, weakness,

headache, breathlessness, apprehension of death, tightness in the chest, visual disturbances, tremor, weakness in the extremities, rapid pulse, cyanosis, unconsciousness or narcosis, collapse, tremor and convulsions, coma, acute mania or delirium preceding sudden death at times, in other cases death occurring several hours to several days after exposure. In extreme concentrations, death results from respiratory paralysis. When the benzol is taken by mouth, an acute toxic gastritis is superadded. Generally, cases of acute poisoning from inhalation are rapidly fatal or respond soon to treatment, with early more or less complete recovery. Late manifestations may, however, appear. Lehmann found concentrations of benzol of 0.015 Gm. per liter of air sufficient to produce confusion within  $\frac{1}{2}$  hour, while 0.02 to 0.03 Gm. produced definite symptoms of poisoning within a few hours.

In *chronic poisoning* the change in the leukocyte count is by far the most important early sign. A fall of 25 per cent. below the lower normal limit of 7500, i.e., to 5625, constitutes reasonably clear evidence of the condition. In 1 man who was still working, the routine study showed a leukocyte count below 2000. There is a relative lymphocytosis and marked decrease of the polymorphonuclears. Leukopenia may reach almost a complete absence of white cells. Red cell reduction then appears, and the number may even fall below 500,000, and the hemoglobin below 15 per cent. The urine may show albumin, fat, casts, hemoglobin, and conjugated sulphobodies.

Young girls and pregnant women are especially predisposed to benzol poisoning, as are also those with general ill-health, tuberculosis, chlorosis, etc., or conditions hindering free elimination. The early symptoms are headache, dizziness, malaise, loss of appetite, fatigability, shortness of breath, and burning of the eyes, throat and respiratory membranes. Later, nausea and vomiting, with epigastric burning and pain, may appear, and sensations of chilliness and general weakness, with bleeding from the mucous membranes. Too frequent menstruation, with prolonged, uncontrollable bleeding from the vagina, is very common. Petechiæ and purpuric hemorrhages may

now appear, or an itching erythema, dry scaling, or vesicular papules. Later, various forms of neuritis, and lesions affecting the dorsal columns and pyramidal tracts, may occur, causing paresthesias, anesthetics, impaired locomotion, tremor, and trophic disturbances.

The lowering of resistance attending the leukopenia of benzol poisoning has been emphasized by Kline and Winternitz. Animals receiving benzol readily succumb, while animals receiving toluol, which produces leukocytosis, exhibit instead an increased resistance. According to Weiskotten and Steensland, benzol, by lowering resistance, may stir up latent or quiescent infection.

Local disturbances have been reported from the prolonged handling of compounds containing benzol, *e.g.*, pricking, tingling and numbness in the extremities, dermatitis of the interdigital webs, papular eruption, erythema, and a temporary disintegrating effect on the skin.

F. T. Hunter and S. S. Hanflig (Boston Med. and Surg. Jour., Aug. 25, 1927) state that absence of a palpable spleen is an important point in differentiating chronic benzol poisoning from idiopathic purpura hemorrhagica and from the so-called aleukemic leukemias.

**TREATMENT.**—In *acute poisoning*, as stated by Greenburg (*loc. cit.*), the patient should be removed from exposure, placed in a **reclining position**, and **carbon dioxide-oxygen** with a respirator, if available, at once administered. If only an **oxygen** tank and respirator are at hand, they may be used, or, lacking these, **artificial respiration** by the prone pressure method should be used until the patient has been breathing satisfactorily for some minutes, to be resumed at the 1st sign of respiratory depression. **External heat** to the body and limbs is important. Cardiac and respiratory stimulants such as **caffeine** may be given. In poisoning by the mouth, **gastric lavage** may be resorted to, followed by **demulcents** or **bland drinks**. **Lecithin emulsion** may be given intravenously, as advocated by Nick, in doses of 5 c.c. (80 minims) of a 10 per cent. solution. Prolonged convalescence is essential in order to avoid complications.

In *chronic poisoning*, in advanced cases with anemia and hemorrhages, treatment con-

sists of **rest, fresh air, sunshine, iron-containing foods**, and the general hygienic measures for secondary anemias, **tonics, hydrotherapy, the ultra-violet rays, etc.** Frequently repeated **blood transfusions** are lauded by McClure. Hunter and Hanflig (*loc. cit.*) likewise advocate transfusions, and direct attention to **cleanliness of the mouth** and the prevention of intercurrent infection in general.

Schustrow and Letawet (Deut. Arch. f. klin. Med., Mar., 1927), from experimental work, deem a fatty diet harmful in benzol poisoning. A reduced amount of cholesterol in the blood tends to protect against the action of benzol.

**BERIBERI.—ETIOLOGY.**—In a report of a Committee on Beriberi Investigation in the Philippines, which includes our Associate Editor, Major A. P. Hitchens (Monthly Bull. of the Philippine Health Service, Dec., 1925), beriberi is stated to be prevalent in the Philippines, its mortality rate, indeed, increasing in the provinces while it is diminishing in Manila. The increased mortality in the provinces coincides with the great demand for laborers and the establishment of modern rice-mill machinery. The predominating type of beriberi is the infantile; among adults, the "dry type." The high mortality is almost entirely due to the infantile type, which accounts for 91 per cent. of the deaths. Rice imported into the Philippines now amounts to only 5 per cent. of the total. A great proportion of the rice produced in the islands is overmilled, the old hand-pounding method having been discarded. Neither the  $P_2O_5$  content nor the degree of unpolishing (microscopically determined) can be considered a safe indication of the vitamin B content of any given sample of rice. The people prefer to eat polished overmilled rather than un-

dermilled rice. Figures available seem to indicate that the common diet of families with beriberi cases is not at all lacking in vitamin B. The Committee advocates extensive propaganda as to the necessity of a balanced diet. The campaign for the production of a larger proportion of food rich in vitamin B should be persistently maintained. Consumption of undermilled rice should be encouraged, and the rice-mills and storage-places for rice regulated to minimize deterioration of the rice through molds, weevils and beetles, which impair the  $P_2O_5$  content and nutritive value of the rice.

Horvath (Nat. Med. Jour. of China, Apr., 1926) finds that soy sauce in some manner stimulates the development of beriberi in pigeons.

A disease resembling beriberi in tadpoles of *Hyla septentrionalis* fed only with bread is described by W. H. Hoffmann (Rev. de med. y cir., Apr. 10, 1926). Five tadpoles thus affected lost all the acute symptoms, however, when fresh water was provided every 2 or 3 hours and no bread allowed during the night, and grew to 4 or 5 times the normal size, continuing as tadpoles for 115 to 198 days, instead of the usual 15 or 16 days. They then died, probably because of some unintentional neglect.

**SYMPTOMS.**—The clinical picture of *acute cardiac beriberi* is described by Vitug (Philip. Isl. Med. Assoc. Jour., Nov., 1926) thus: There is dyspnea or labored respiration, cyanosis and congestion of the face, pulsating veins in the neck, an increased area of heart dulness, rapid heart beat, a weak 1st mitral sound, and a palpable, enlarged, pulsating liver. Diagnostic manifestations include heaviness and numbness of the lower limbs, sometimes with anesth-

esia over the tibial surfaces, oppression and a sensation of constriction about the chest, and aphonia, or at least a small, deep voice. The enlarged neck and swollen, rounded, congested face at once attract attention. The failing heart of beriberi is rather refractory to digitalis, even in large doses.

In Brazil, according to M. Couto (Arch. f. Schiffs- u. Tropenhyg., July 1, 1926), true beriberi is generally regarded as an infectious disease. Deemed significant in this connection are its epidemic propagation, occasional fulminating type, digestive troubles at the outset, disturbances of the circulation and bladder, rapid heart rate, reduplication of the 2d sound, gallop rhythm, tendency to edema, girdle sensation, and acute heart weakness. The disease, endemic in northern Brazil, is rare in the southern portion, in spite of the fact that the rice used is the same and prepared alike throughout the country. Patients get well at once on leaving the endemic foci, but are likely to relapse on returning, even if no rice is eaten. The Brazilian beriberi is therefore to be distinguished from the European polyneuritis, while admitting that a syndrome resembling true beriberi but due to rice may occur.

**TREATMENT.**—The Committee on Beriberi Investigation (*loc. cit.*) notes that **tikitiki extract** is considered in the Philippines as the sole cure for infantile beriberi, although it has little or no value in beriberi in adults. It has equal, if not greater, value as a prophylactic than as a curative remedy, and the 40 per cent. reduction in mortality from beriberi in Manila in recent years has been due to its use. The product is a rice-

bran extract. About 20 50-c.c. bottles are required by each patient for complete recovery. Its value was shown experimentally in birds fed with polished rice.

**BILE.**—When 1 ounce or more of brownish, dark greenish or black bile is recovered through the duodenal tube upon instillation of magnesium sulphate, according to M. Lake (Amer. Jour. Med. Sci., Dec., 1927), the X-ray shows a considerable decrease in size or even disappearance of the gall-bladder. When dark bile is not recovered, even though large amounts of yellow bile appear, the gall-bladder shadow is either absent or does not decrease in size. When a smaller amount of dark bile or a larger amount of amber-colored bile is secured, the gall-bladder shadow usually decreases slightly in size. The value of the Meltzer-Lyon method for diagnosis depends theoretically on whether gall-bladder contents can actually be obtained for examination, and the above results seem to indicate that the dark "B" bile is really derived, at least in part, from the gall-bladder. The dark bile so obtained contains, after oral administration of sodium tetraiodophenolphthalein, an average of 48 times as much iodine as the bile that precedes it and 10.8 times as much as the bile that follows it, and may be the only fraction containing any iodine (14 hours after taking the dye).

Studying the *bacteriology* of the bile, S. Hansen (Hospitalstid., Apr. 1, 1926) obtained positive results in 41.4 per cent. of the cultures taken from the bile at 157 autopsies. The bile was cultured irrespective of the terminal illness in the cases concerned. Among the cases of gall-stone operation the bile yielded positive cultures in 42.5 per cent. The theory of infection as being a prerequisite to calculus formation appeared discredited by the fact that the more recent stones occurred mainly in healthy gall-bladders with sterile bile, while the older calculi were in abnormal gall-bladders with infected bile, tending to show that the infection had been secondary.

A study of bile secretion from a case of biliary fistula is reported by S. G. Ross (Jour. of Lab. and Clin. Med., Aug., 1927). The man of 56 years had been operated for

acute intestinal obstruction caused by adhesions around the upper small intestine, and had developed deep jaundice, for which drainage of the common duct was instituted with good results. Although the biliary radicles were well outlined by lipiodol in X-ray films, no gall-bladder was seen. The average daily secretion of bile ranged from 725 to 1012 c.c. The patient had developed a desire to drink his own bile, and when this was discontinued the daily output decreased more than 300 c.c. and the specific gravity of the secreted bile was reduced. A high carbohydrate diet was tolerated best. A high fat diet could not be tolerated. A high caloric diet gave an increase in the daily output of bile. The diet most acceptable to the patient contained 450 Gm. of carbohydrate, 40 Gm. of protein, and 20 Gm. of fat, yielding about 2140 calories. The blood calcium and phosphorus remained constant and seemed to be independent of the ingestion of bile.

Establishing a gall-bladder fistula in dogs to study the effects of various substances on bile flow, Meissner (Arch. f. exp. Path. u. Pharm., Aug., 1926) observed that combinations of salicylic acid with sodium cinamate and of benzoic acid with theobromine sodio-salicylate increased the secretion of bile more than uncombined compounds. Some of the results were verified clinically, and there is a possibility of benefit from such combinations in jaundice.

Endeavoring to disinfect the bile with drugs, O. Specht (Münch. med. Woch., May 14, 1926) found that methenamine, iodine and acriflavine passed into the bile in small amounts, but they did not appear to modify the content of bacteria in the gall-bladder or liver bile. Administration of acetylsalicylic acid failed to induce elimination of salicylic acid in the bile.

**THERAPEUTICS.**—In experimental and clinical work, R. St. L. Brockman (Lancet, Aug. 13, 1927) found that rectal injection of bile brings clinical relief in **acute intestinal obstruction**. It is possible by this measure to keep a patient fit for days even though there is an unrelieved organic obstruction. If possible, freshly secreted human bile from a cholecystostomy is used, but the bile can be kept in an ice-chest for at least a week without losing any of its potency. Two ounces (60 c.c.) of human



bile in 4 ounces (120 c.c.) of saline solution are run into the rectum with a tube and funnel. The procedure is repeated every 4 hours. Ox bile is inferior in that the effects are not obtained so easily or quickly and that it brings on colicky pain so severe as to require morphine. Human bile does not cause such pain. If the full remission of the toxemia and its attendant symptoms is not obtained, the amount of bile is increased by  $\frac{1}{2}$  ounce (15 c.c.) at a time, the dilution remaining in the same proportion. Three ounces (90 c.c.) of bile at a single injection have never had to be exceeded before obtaining the desired results. When definite improvement is seen and the bowels have been opened it is safe to ease off the amount of bile. If the vomiting returns it is possible to get the patient at once under control again by increasing the amount of bile to that previously effective. Nothing but water and orange juice, with glucose, can be allowed until the ileus is overcome.

The 13 cases treated with bile all had ileus in the stage of stercoral vomiting. In the 1st case, no other bile being available, the patient's bile-stained vomitus was diluted and injected into the rectum with successful results. In several of the cases described the obstruction had followed operation for gangrenous appendix. Four cases died—2 from insufficient familiarity with the treatment, 1 from intraperitoneal rupture of a cecostomy, and 1 from an unknown cause. In 1 of the first 2 mentioned the woman of 65 lived 16 days with complete obstruction due to a strangulated loop of small intestine. In most cases after the 1st rectal injection of human bile the vomiting stops at once, the violent hiccough disappears in a few hours, the drawn, anxious expression fades rapidly, the dry furred tongue becomes moist and clean in spite of an unrelieved organic obstruction, restlessness is abolished, and the abdominal distention disappears without any passage of flatus by rectum. If the vomiting returns on cessation of the bile, and the bowels are not open satisfactorily, the abdomen must be reopened, as it is almost certain that there is a mechanical obstruction present.

#### BILE DUCTS.—ANOMALIES.

—In a man aged 52, suffering from jaundice with abdominal pain, I. J.

Walker (Boston Med. and Surg. Jour., May 5, 1927) found, aside from a gall-bladder firmly contracted about a single stone, that the hepatic duct led directly into the gall-bladder and another duct led from the gall-bladder into the duodenum. No duct connecting the hepatic and common ducts could be found. All the bile from the liver passed through the gall-bladder on its way to the bowel. An opening which had been made in the duct was closed and cholecystostomy done. The drainage tube came out on the 9th day. After 9 days more, the sinus closed. There were no subsequent symptoms. The arrangement of the ducts in this case is normal among some of the lower vertebrates.

**DILATATION.**—The gall-ducts are known to dilate after cholecystectomy, the bile having no gall-bladder to enter, and the normal static pressure in the intestine holding the duct valve closed. R. C. Coffey (Ann. of Surg., Apr., 1926) reports experiments on the transplantation of ducts into the intestine showing that when a valve is not produced by the operation the common duct always dilates, while when a true valve is produced, it does not. Clinically, dilatation of the common duct generally causes no striking symptoms. Yet in a few cases stones form in such ducts, in many more there is some ill-health, and occasionally an operation becomes necessary. In 1 such case, after stones had been carefully removed from the common duct and the latter drained, the patient returned after 7 months with a history of repeated fever, distress around the gall-bladder and an occasional slight yellow color. At operation, the common

duct was found enormous, containing yellow bile, but showed no infection or stone.

In 10 normal livers, Counseller (Ann. of Surg., Feb., 1927) found that the internal diameter of the common hepatic ducts did not exceed 5 mm. Of 8 livers in which the gall-bladders contained unsuspected stones, 7 showed general enlargement of the ducts, the diameter of the dilated common hepatic ducts being between 6.5 and 11.5 mm. In 3 cases in which cholecystectomy had been performed 8, 9 and 10 days before death, dilatation of the biliary ducts was present. In 5 cases with benign or malignant strictures of the common hepatic duct, the diameter of this duct ranged from 10 to 30 mm. The process extended throughout the whole biliary tree, grossly as far as the 5th order of branches.

**PLASTIC REPAIR.**—Bridging gaps in the bile ducts with a rubber drain covered with tissue flaps was found feasible by Muzeneek (Deut. Zeit. f. Chir., Apr., 1926) in dogs. This is a procedure applicable where choledochoduodenostomy or hepaticoduodenostomy is impossible. The ends of the drain must be securely sutured to the duct walls. As covering for the drain, omentum and segments of vein are best. The tissues soon turn into fibrous material which, in contracting, shortens the defect and pulls the duodenum toward the liver. The rubber drain is to be left *in situ* as long as possible. Upon removing it the writer found that the inner surface of the channel of scar tissue had become lined with epithelium.

**RUPTURE.**—Some days after a severe industrial accident the boy of

15 years referred to G. Leclerc and P. Lecène (Bull. Soc. nat. de chir., lii, 1208, 1926) developed attacks of abdominal pain with vomiting, tenderness, but no rigidity. Several days later a dull, cystic, slightly tender tumor appeared in the epigastrium, and gradually increased in size. Operation 25 days after the injury revealed a cystic accumulation of bile, which was evacuated and drained, and the abdomen closed. Recovery was uneventful. In *choleperitoneum* recognized late and well encysted, simple **drainage** insures recovery. Longitudinal tears of the gall-bladder or bile ducts show both experimentally and in man a tendency to heal rapidly, provided no intracanalicular obstruction is present. Transverse ruptures, however, lead to a biliary fistula which may be fatal if only incision and drainage of the accumulation are carried out. Prompt **reconstruction of the ducts** is indicated in such cases, and is best effected by carefully suturing over a rubber tube in the duct.

**STRICTURE.**—*Benign strictures* of the extrahepatic ducts, when congenital, occur most commonly at the ampulla, are usually autopsy findings, and are rare in adults. Acquired benign strictures, as noted by R. T. Miller, Jr. (Ann. of Surg., Aug., 1927), may be either traumatic or inflammatory. The former are surgical, while the latter are usually due to gall-stones producing abrasions of the common duct, and well circumscribed. In a 3d form of acquired stricture, of which the writer reports 3 cases, complete fibrosis of the common duct along its entire length exists. It is ascribed by some to an infectious cholangitis ending in necrosis of the

mucous membrane. The symptoms are those of common duct obstruction. Delay in the appearance of jaundice in a case with a long history of recurrent attacks of colic may be suggestive of this condition. **Cholecystgastrostomy** or **cholecystenterostomy** is now the best therapeutic measure. In the writer's cases the lumen of the common duct was found almost entirely obliterated. The gall-bladder was also thickened, but filled with bile and free of stones.

**BILHARZIASIS.**—The importance of remembering this infection in any obscure hematuria, especially if the subject has lived where the disorder is prevalent, is illustrated by a case recorded by M. Cutler (Jour. Amer. Med. Assoc., Mar. 20, 1926). A man aged 33 had lived in Turkey for 14 months at the age of 22, then came to New York, and had remained there ever since. While Castellani and Chalmers state that most patients cease to pass ova 3 years after leaving the endemic area, this man's urine showed ova after the 10 years' interval. The ova were first discovered, however, in specimens of bladder mucosa. The general health was unimpaired, the condition seemed to have continued well localized to the bladder, and the urinary symptoms remained practically stationary.

In a patient complaining of backache and a vaginal discharge, and who had been operated on for retroversion of the uterus, A. Plaut (Arch. of Path. and Lab. Med., May, 1926) found bilharzia ova in the wall of the appendix as well as in the cervix uteri and the stools.

According to A. B. Ibrahim (Jour. of State Med., Dec., 1927), bilharziasis

is now the most prevalent disease in Egypt. It flourishes where fresh water is abundant, corresponding closely in distribution to the more modern irrigation system, but is least prevalent where the ancient basin method of irrigation is still adhered to.

**TREATMENT.**—A successful attempt at eradication of bilharziasis in an endemic area is reported by M. Khalil (Lancet, Dec. 10, 1927), of Cairo. At the Egyptian oasis, Dahkla, 40 per cent. of the inhabitants submitted their excreta for examination, and 63.5 per cent. were found infected with *Schistosoma hæmatobium*. The main stream of the village, originating from an artesian well, was found to contain large numbers of bullinus snails—the intermediate host of the infection. **Copper sulphate** was continuously added to the stream for 4 days and nights by a specially improvised apparatus, the dilution aimed at being 5 parts of the copper salt to 1,000,000 of water. All the bullinus snails were thus killed. Six months later no living snails could be found. No deleterious effects on the vegetation, animals or man were observed.

**BIRTH INJURIES. —PARALYSIS.**—Among 1100 cases of obstetric paralysis, J. W. Sever (Jour. Amer. Med. Assoc., Dec. 12, 1925) found the right arm affected in 64 per cent., as against 36 per cent. for the left arm. There were 829 cases of the "upper arm" type, as against 208 of the "lower arm," or better, the "whole arm" type, in which, besides the 5th and 6th cervical roots, the 7th and 8th cervical and 1st dorsal roots are injured. Prolonged and difficult labor was recorded in 584 cases, in a large proportion of which forceps were used and most of the mothers had

ether, implying a relaxed and asphyxiated child. In some the head had been delivered naturally but the shoulder stuck behind the pubes, at which time force had been applied. There were recorded 443 head or face presentations and 142 breech, refuting the view that breech presentations are the usual cause of the whole arm type of paralysis. Cord injuries, however, practically always follow breech extraction and are due to traction and lateral flexion of the trunk. Pupillary inequality is of great importance. Many cases present this at first, with the small pupil on the affected side. If it persists in connection with the wrist drop or whole arm paralysis beyond 6 or 8 weeks, the writer is certain of a serious injury to the plexus probably resulting in avulsion of the 2 lower roots from the spinal cord, breaking the sympathetic arc to the eye. Persistent anisocoria means certainly a bad prognosis.

In the whole arm type, **massage** and **muscle reëducation** may be tried for 3 months; if then there is no evidence of functional return, one may **explore** the **plexus** and attempt to **repair** it. In the upper arm types the writer often waits until the children are 4 or 5 years old, because by that time he can also **divide muscle contractures** that are preventing free use of the arm.

From researches on 17 stillborn infants, R. J. Harrenstein (Ned. Tijd. v. Gen., Aug. 20, 1927) was led to conclude that the brachial plexus of the child at term is readily stretched and torn, especially at Erb's point. Nerve injury is particularly likely if the normal distance between the cervical spine and shoulder becomes increased

during parturition. Sometimes, however, the paralytic manifestations are in reality due to *injury of the humeral epiphysis*. The X-ray is frequently of aid in distinguishing such pseudo-paralysis, which calls for treatment different from that of plexus injury.

A. M. Marque (Arch. Lat.-Amer. de ped., Feb., 1926), going further than the preceding writer, asserts that exclusively nervous paralysis occurred in only 5 per cent. of 118 cases of birth paralysis seen by him. In 85 per cent. the pseudo-paralyses were due to *epiphyseal detachment, hemorrhage about the epiphysis, or injuries in or about joints*. In the remaining 10 per cent. true and pseudo-paralysis were combined. Radiography is diagnostic by showing whether the center of ossification is normal in location or not; such differentiation is feasible as early as the 2d to the 4th weeks. The history of the delivery and the clinical course are also of differential utility, and after the age of 4 months has been reached, electric tests may be informative.

Regarding obstetric *facial paralysis*, P. B. Bland (Amer. Jour. of Obst. and Gyn., Apr., 1926) notes that the cases following spontaneous labor occur only when there is frank disproportion between the fetal head and maternal pelvis, *viz.*, in contracted pelvis, especially the flat pelvis, with the head presenting transversely and excessive cranial stress being directed from the sacral promontory, symphysis, or an abnormal bony prominence. The trouble generally arises after primary cephalic presentations, rarely after breech presentations. Among 22 cases of facial paresis, mostly from direct or indirect forceps injury, studied by S. Hindse-Nielsen (Hos-



pitalstid., May 27, 1926), contracted pelvis had been present in 4. Spontaneous delivery had occurred only in 2 instances.

**SUBCUTANEOUS FAT NECROSIS.**—This condition, due to trauma during parturition or violent attempts at resuscitation, is characterized by the appearance during the 1st few days of life of subcutaneous nodules or plaques, with the overlying skin red, hard and stiff. In a case reported by N. Sysak and R. Wilfand (Med. Klin., Sept. 23, 1927), the condition appeared on the 9th day. The hard nodules were found histologically to consist of nests of lipoid-containing, pseudoxanthomatous cells of varying size, giant cells, large fat cells, and masses of calcified soaps. The condition is thus histologically different from scleroderma, with which some have confounded it. The writers do not consider the areas of necrosis as being the end-result of an inflammation due to trauma, but believe that the trauma simply acts as a stimulus to the collection of cholesterol in macrophage cells in the subcutaneous tissue. The condition thus occurs especially in cholesterophile children. In the writers' case a moderate hypercholesterinemia of 0.18 per cent. was present.

**TENTORIAL LACERATION.**—According to A. H. Baker (Jour. of Obst. and Gyn. of Brit. Emp., xxxiii, 224, 1926), tears of the tentorium are an indication, not merely that undue force has been exerted on the head, but rather that it has been exerted in the wrong diameter, *viz.*, the occipitofrontal. That this type of force is injurious to the cranial contents is shown in that the majority of cases of fatal intracranial stress show lesions

of the tentorium. Other postmortem evidences of cranial stress are marked engorgement of the pial vessels, of the choroid plexus and of the intracranial sinuses, and intracranial hemorrhages. In the application of forceps and in breech deliveries, **full flexion of the head**, aside from involving a smaller cephalic diameter and thus aiding delivery, would prevent many cases of tentorial rupture.

[See also CEREBRAL HEMORRHAGE and NEWBORN, DISORDERS OF.]

**BISMUTH.—PREPARATIONS AND ADMINISTRATION.**—An X-ray study of the rate of absorption of the insoluble compounds of bismuth was made by H. N. Cole, H. L. Farmer and H. Miskdjian (Arch. of Derm. and Syph., Feb., 1926), in order to discover the most advantageous preparations to use. With *potassium bismuth tartrate*, absorption was noted in 22 of 30 injections in a mean period of 14 days. With 7 injections, deposits were observed even as late as 39 days. The writers recommend that injections of this preparation be given only once a week, intragluteally, and that the patient be carefully watched. With *bismuth salicylate*, the results were not as good, complete absorption being observed in only 10 of 44 injections in a mean period of 45 days. With *bismogenol* no appreciable absorption was noted in 44 days. *Bismuth oleate* proved particularly inert in the tissues, and has only a low metallic bismuth content. Finely divided *metallic bismuth* was still unabsorbed after 143 and 150 days, and should probably never be employed because of the danger of cumulative action. In general, the contention that bismuth salts must be injected twice weekly for even, gradual absorption was not borne out by this study.

*Bismuth salicylate* was found by Ballenger and Elder (Amer. Jour. of Syph., Oct., 1925) to be surprisingly efficacious in the treatment of **syphilis**. It is relatively non-toxic and produces very little pain when administered intramuscularly. It seemed quite as effective as foreign and more expensive bismuth preparations on the market. Among the 2500 doses given by the writers,

in no instance did an abscess form at the site of injection. With doses of 2 or 3 grains (0.12 or 0.2 Gm.), in no patient was it necessary to discontinue the treatment on account of pain or toxic symptoms.

Among the insoluble salts Sauphar (Médecine, Apr., 1925) prefers the *tartro-bismuthate*, *bismuth hydroxide*, and *quinine iodobismuthate* (quinby). He considers *colloidal bismuth* a very useful preparation. Soluble bismuth in aqueous solution seems effective but is more painful.

According to O. M. Gruhzt and J. A. Sultzberger (Amer. Jour. of Syph., Jan., 1927), *bismuth salicylate* is absorbed more rapidly and therefore preferable to bismuth potassium tartrate or bismuth oleate. They favor, however, a new soluble *sodium bismuth thioglycollate*, which is completely absorbed from the site of injection in about 2 hours. It is rapidly distributed through the body, and remains in the blood-stream about 72 hours. After 6 hours, analyses showed it had reached every organ and tissue in the body. After 25 days, the concentration in the various organs remained about the same. The bismuth appeared to be deposited in the bone in higher concentrations than in other organs, except the kidneys and spleen. Its peak of elimination in the urine and feces was reached in 72 hours, as against the end of the 1st or beginning of the 2d week in the case of insoluble preparations, such as the salicylate.

**PHYSIOLOGIC ACTION.**—An experimental study of the effects of intravenous injection of a soluble bismuth salt, *viz.*, sodium and bismuth tartrate, on the *circulation* has been made by G. A. Masson (Jour. of Pharm. and Exp. Ther., Dec., 1926). A fall in blood-pressure was found to occur after  $\frac{1}{10}$  of the minimal lethal dose. Other effects of doses constituting fractions of the lethal dose were slow heart beat, lessened amplitude, and irregularities of rhythm. After fatal doses, death was attended with circulatory failure.

The effect of bismuth on the *kidneys* has been investigated by H. Brown, E. R. Saleeby and J. F. Schamberg (*ibid.*, Aug., 1926). Their studies indicated that bismuth is a drug of relatively low toxicity. As much as 0.03 Gm. per kilo., or 9 times the human therapeutic dose, was injected into rabbits without causing an alteration in the

blood chemistry indicating nephritis or histologic evidence of material kidney damage. The changes in the kidney secretions correspond in general with the blood urea findings. Blood-chemistry tests should, therefore, prove of value in controlling bismuth therapy in man.

On the other hand, according to W. Lichtenberg (Derm. Woch., May 29, 1926), a considerable proportion of cases receiving bismuth preparations show unfavorable effects on the kidneys. Of 64 cases receiving nadisan, spirobismol and bismogenol,  $\frac{1}{3}$  exhibited such effects: Five showed renal epithelium in the urine, 3 casts, 10 casts and albumin, and 3 erythrocytes in addition. In 3 cases in which the bismuth injections were continued in spite of these findings, the evidences of unfavorable action became more marked. Cessation of the treatment, with rest, usually sufficed to clear up the urine. In the more pronounced cases a salt-free diet was also ordered, and the urine cleared up in about 2 weeks. Generally the changes in the urinary sediment had appeared only after 7 or 8 injections of bismuth. Bismuth injections should be stopped when casts appear, and, in general, the urine should be examined before every bismuth injection. When bismuth is contraindicated on account of the condition of the kidneys, mercury may be substituted.

**TOXIC EFFECTS.**—That the use of bismuth in *syphilis* cannot be considered altogether free from danger is pointed out by J. M. Mora (Arch. of Derm. and Syph., Oct., 1927). Its toxic effects include a gum line, gingivitis, stomatitis, gastrointestinal and renal changes, and central nervous involvement. In some instances, comparatively small doses of bismuth have caused death. The writer reports a case of severe stomatitis.

A case of severe *enteritis with ulceration* due to bismuth, with only a slight stomatitis and no renal injury, is reported by O. Fischer (Derm. Woch., Feb. 20, 1926). The effects were not attributable to excessive dosage or to cumulative action. Experiments have shown that  $H_2S$  in the intestine may cause increased excretion of bismuth in this viscus, followed by its accumulation in the capillaries and deep pathologic changes in the mucous membrane. In

this patient an excess of  $H_2S$  may have been present and led to the peculiar exclusive localization in the bowel.

In a patient alluded to by J. Destéfano and R. S. Aguirre (*Semana méd.*, Feb. 17, 1927), the 2d bismuth injection was followed in 6 hours by *myalgia* and *arthralgia* in several joints. The same effects attended the 2 succeeding injections. On stopping the treatment the manifestations subsided.

Bismuth *dermatitis* rarely occurs, but 4 cases are reported by J. L. Grund (*Boston Med. and Surg. Jour.*, June 16, 1927). The 1st case had a pruritic eruption consisting of wheals and lasting 1 day. The 2d had palm-sized, slightly raised and indurated dark red areas on the buttocks, with interspersed papules. The 3d had a diffuse erythema over the anterior aspects of the lower legs, with scaling and surrounding patchy pigmentation, followed, upon continuation of bismuth treatment, by an extremely pruritic, red and scaling erythematopapular eruption on the cheeks, forearms and upper torso. The 4th case was seen with markedly edematous face, closed eyes exuding purulent fluid, spongy and dark-purplish gums, gray membranous plaques within the cheeks, congested fauces, brownish-red follicular papules over the chest, back, abdomen and legs, purulent fluid under the epidermis of the palms and soles, thick yellowish-black crusts in the interdigital spaces of the feet, fissured skin at the roots of the toes, and an ulcer over the left instep. Gradual recovery occurred under 11 intravenous injections of **sodium thiosulphate**, 0.5 to 1 Gm. ( $7\frac{1}{2}$  to 15 grains). In this patient previous arsphenamin treatment had been stopped because of an erythema on the forearms.

In the severe cases, **X-ray** treatment may be necessary to efface the last vestiges of the eruption.

Several *deaths* from bismuth have been reported. In a case of acute poisoning in a syphilitic man recorded by Aubertin and Destouches (*Bull. Soc. méd. des hôp. de Paris*, Feb. 27, 1927), death followed a single intramuscular injection, and was the result of azotemic nephritis with grave stomatitis. Inadvertent injection of the bismuth into a vein is blamed by Chenoy (*Indian Med. Gaz.*, May, 1926) for the death of a man, with every evidence of bis-

muth poisoning, 2 hours after an intramuscular injection.

In a case recorded by J. Munck (*Derm. Woch.*, Mar. 12, 1927), a man aged 45 had been given 5.13 Gm. of bismuth in 11 months. The 1st symptoms were jaundice and stomatitis. Later the temperature became subnormal and delirium set in, death following in 12 days. The signs of poisoning included stomatitis with ulcerations and dark line on the gums, nephrosis with oliguria, casts and albumin, colitis with leukocytic infiltration, fatty degeneration of the liver and heart-muscle, and emaciation. Bismuth in large amounts was found in the viscera.

A bismuth abscess, leading to acute pelvic peritonitis, is held responsible for the death of a patient aged 50 by Foged (*Ugeskr. f. Læger*, Nov. 17, 1927). The patient was on combined bismuth and arsphenamin treatment, and had also an arsphenamin dermatitis.

J. A. Gammel (*Jour. Amer. Med. Assoc.*, Mar. 26, 1927) reports 2 cases in which, during the first 24 hours after intramuscular bismuth injection the patients developed locally an extremely painful swelling which enlarged during the succeeding days. It was diffuse and more superficial than in the common type of local reaction. A striking feature was bluish discoloration of the major part of the buttock, forming a mar-maraceous network with diffuse bluish meshes about 2 cm. ( $\frac{3}{8}$  inch) wide. The condition subsided in 2 or 3 weeks under **rest in bed** and **hot applications**. In a 3d, more serious, case, the bismuth injection was followed by numbness in the foot persisting 8 hours, with burning and pain in the hip, with general sickness, anorexia and insomnia. One week later the right buttock was swollen, with the bluish network, and the patient had pain shooting down into the ankle and presented a paralysis of the peroneal nerve. Subsequently the skin over a portion of the buttock became necrotic and on removal of the slough the muscle was exposed. Complete recovery eventually occurred.

Approximately 30 similar reactions have been reported from mercury or bismuth injections, and are ascribed to injection of the drug into an artery, producing an arterial embolism with its various attendant results.

A case of poisoning from *ingestion* of bismuth has been recorded by W. H. Resnik (Bull. Johns Hopk. Hosp., May, 1926). In a period of 5 days the patient had taken 30 Gm. (1 ounce) of bismuth subcarbonate without untoward results. A month later she returned with a bluish-black discoloration of the gums, tongue and buccal mucosa, with slight ulceration, moderate anemia, basophilic stippling of the erythrocytes, and tenderness and swelling of the parotid glands. Abdominal colic and evidences of a mild peripheral neuritis were also present, but dependence of these on the bismuth poisoning is questioned. Recovery occurred.

**THERAPEUTICS.**—Reports on the value of bismuth in syphilis have been generally favorable. According to D. Lees (Brit. Med. Jour., Aug. 20, 1927), who has employed over 100,000 injections of it, bismuth influences the surface lesions of syphilis as rapidly as the arsphenamins, and more rapidly than mercury. A combination of bismuth and arsenic is more effective than either of them alone, and is not dangerous in therapeutic doses. The administration of metallic bismuth in isotonic dextrose solutions is remarkably free from pain and side-effects, and in this respect is better tolerated than arsenic or mercury. Bismuth is very valuable in syphilitics intolerant of arsenic and mercury, as well as in patients with advanced organic disease, whether the latter is due to, or is intercurrent with, the syphilis. Intramuscular injection of an insoluble bismuth compound gives better results and is less apt to be toxic than other methods, such as colloidal bismuth intravenously or soluble salts intramuscularly.

In general, bismuth is only an adjuvant in syphilis treatment, and should not be used alone unless there is intolerance of the other drugs.

A limited clinical experience with the soluble *sodium bismuth thioglycollate* leads Gruhzt, E. Lyons and R. Perkins (Arch. of Derm. and Syph., May, 1927) to conclude that it produces somewhat more rapid improvement in lesions than do the insoluble bismuth compounds. It causes no lumps or pain locally when given in aqueous solution. The patient can be saturated readily without danger of cumulative action.

The Wassermann reaction was influenced repeatedly.

In a comprehensive test of the action of bismuth in 187 *Wassermann-fast tertiary luetics* who had failed to respond to other methods of treatment, F. S. Mason (Med. Jour. and Rec., Sept. 21, 1927) gave at least 1 course of 20 injections of 2 c.c. each of x-iodo-bismuth, weekly or semi-weekly. When serologic response was lacking or unsatisfactory, a 2d course was given after a few weeks' intermission. The results obtained, *viz.*, 33.6 per cent. negativity when last seen, 20.8 per cent. serologic improvement with subsequent slight recurrence, and 45.6 per cent. little or no improvement, may be considered satisfactory. Bismuth preparations have a definite place in the treatment of Wassermann-fast cases, and are superior to mercury for that purpose. Regardless of the serologic results, all the patients treated showed very definite improvement in their general condition.

According to A. Landau, I. Marjanko and M. Fergin (Presse méd., Dec. 9, 1925), bismuth is of value in the treatment of **mercury poisoning**. Nine out of 12 cases in which it was used recovered, including 1 with anuria persisting for 7 days. The writers give bismuth subnitrate and bismuth subcarbonate, 0.75 Gm. (12 grains) of each, 4 to 6 times a day. The usual measures are employed in addition to the bismuth. The diet is limited at first to orange juice and sweetened tea; later a low-protein diet is given. The bismuth treatment is held to produce its benefit by combating infected ulcers in the alimentary tract to which the obstinate vomiting, bloody diarrhea and severe pain are due.

The bismuth treatment of **yaws** is discussed by H. Leach (So. Afr. Med. Rec., Oct. 9, 1926). He prefers the aqueous solution of bismuth and sodium tartrate to the use of bismuth metal in isotonic glucose solution. Fewer injections of the former preparation are required, and hospitalization is shortened. In any isolated case admitted, however, he gives an immediate injection of the metallic bismuth, in view of the fact that the preparation of such a small quantity of solution as a single dose of bismuth and sodium tartrate is tedious and rather difficult. If further treatment is required, the aqueous solution is employed.



**BLADDER.—CALCULI.—**  
**ETIOLOGY.**—Exogenous bacteria, gaining entrance to the urinary tract by direct implantation, and concerned with the formation of calculi, are stressed by B. H. Hager and T. B. Magath (Jour. Amer. Med. Assoc., Jan. 28, 1928). They report 5 cases of lithiasis of the urinary tract, including 4 of vesical calculus, in which the organism *Proteus ammoniæ* was isolated. In several rabbits and guinea-pigs they succeeded, by injecting cultures of this organism in the bladder, in producing free stones of fair size, one 10 mm. in diameter. In controls in which *B. coli* was instilled, neither stones nor incrustated lesions were ever produced. *P. ammoniæ*, being able to convert urea rapidly into ammonia, precipitates the alkaline earthy salts in the urine, forming chiefly the carbonates and phosphates of calcium and magnesium. It is possible that deficiency of vitamine A is favorable to the implantation of this organism.

R. McCarrison (Brit. Med. Jour., Apr. 16, 1927) reports the experimental production of stone in the bladder in rats by means of an ill-balanced diet composed of foods commonly used by man, *viz.*, tinned oatmeal, linseed meal, and tinned cornflour, together with sodium chloride, calcium phosphate, and distilled water. The main faults of this diet, to which faults the production of calculus was ascribed, were: (a) Absence of protein of animal origin; (b) deficiency of vitamine A, and (c) excess of earthy phosphates. To these faults there may possibly have been added a toxic action of the diet itself on the urinary tract. The same writer (*ibid.*, July 30, 1927) found that the addition of whole milk, in

the proportion of  $\frac{2}{3}$  ounce per rat daily, to a diet capable of causing urolithiasis in 50 per cent. of young rats, completely prevented the development of phosphatic calculi.

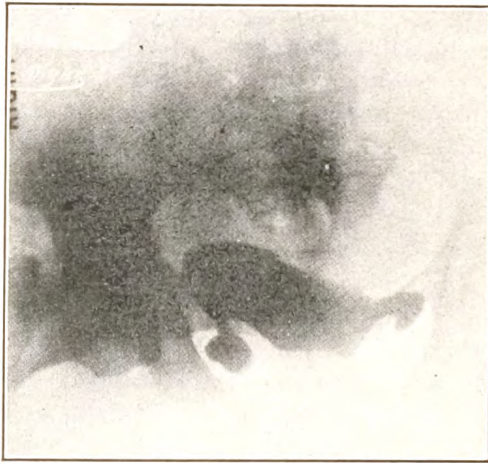
**DIAGNOSIS.**—In doubtful cases of bladder stone or tumor A. Fryszman (Zeit. f. Urol., xx, 321, 1926) has the X-ray views taken with the patient in the *Trendelenburg position*, which has many advantages under these circumstances. In tumors, after the bladder has been filled with air, particularly useful information is obtained.

**CONTRACTURE.**—Rubritius and O. Schwarz (Jour. of Urol., May, 1926) note that most varied pathologic changes in the bladder sphincter and its nerve-supply may lead to retention of urine. A strict differentiation between structural and functional factors is not possible. A common functional factor in practically all retentions, however, is *hypertonicity of the sphincter*, which is the same whether induced by a small adenoma or by inflammatory contractions. In some cases this hypertonicity stands out so markedly that it must be regarded as the sole cause of the retention. The treatment consists of a transvesical **incision into the sphincter**, with **enucleation of any periurethral adenomas** that may be present.

Four cases of contracture of the neck of the bladder and 2 of sclerosis are reported by R. Knorr (Zent. f. Gyn., May 7, 1927). Cystitis of the neck and trigone was an etiologic factor in these cases. The treatment he advises for most patients is slow and cautious **stretching of the sphincter**.

**CYSTITIS.**—See CYSTITIS, this Volume.

**DIVERTICULUM.**—According to D. K. Rose (Arch. of Surg., Feb., 1927), all bladder diverticula are congenital to the extent that a loose fibrous tissue pathway must be present through the bladder wall before the acquired factor, *viz.*, a raised intracystic pressure, can herniate the mucosa. The relative absence of muscle in diverticula suggests herniation; when muscle is found, it is usually a stray bundle which, because of



Cystogram showing bladder diverticula in a woman aged 65. The diverticulum on the right is of the retention type, the left only partially so. Relief of the symptoms followed dilatation of the strictured urethra. (Pugh, in *Surg., Gyn. and Obst.*)

fixation by infection or accidental location, has not slipped down to the base of the dissecting cellule. Early removal of any bladder obstruction is particularly indicated when a predisposition to diverticulum is suggested by the presence of 1 of its early stages, *e.g.*, a ballooning cellule.

W. S. Pugh (Surg., Gyn. and Obst., Nov., 1927), in over 50 cases, was impressed by the fact that in every instance of a real diverticulum, there had been a urethral or vesical obstruction of greater or less degree

over a period of years. He estimates the percentage of bladder diverticula at from 5 to 7, with  $2\frac{1}{2}$  per cent. in the female bladder. Among 100 cases, 11 were noted between the ages of 30 and 40 years, 30 between 40 and 50, and 41 between 50 and 60. From 70 to 80 per cent. of diverticula are located near the ureteral openings. The condition is lacking in characteristic symptoms. The nearest to a typical symptom is double voiding, in which the patient apparently empties the bladder and the desire appears again in a few moments. Sometimes the patient feels a ball which seems to rise and fall in the pelvis. The diagnosis can as a rule be made by careful cystoscopy, though some cases will escape the eye of the most painstaking observer. Cystography, using a 5 per cent. solution of neosilvol, gives the most exact diagnosis possible, though in many instances at operation a much greater sac than expected is found.

When the sacs are not over 2 or 3 in number, the outlook from **surgical treatment** is good; when they are numerous, the possibilities of cure are remote, though nearly always alleviation can be expected. Mere suture of the diverticulum is now an unsurgical procedure. Often a **preliminary treatment** similar to that for prostatectomy must be carried out. A definite urinary obstruction must receive treatment before the diverticulum is considered. In 1 case described removal of liberal sections from the bladder neck with a Young punch under sacral anesthesia gave sufficient symptomatic relief, and in another, removal of a good-sized section of a interureteral bar with a large fulgurating tip. The principal



methods of radical treatment at present are the **intravesical removal** of Young and the combined **intravesical and extravesical technic** of Lower. Some cases can be cured by excision. In many others, great relief may be secured by palliative surgical procedures. For bladder irrigation in these cases, the writer finds a 1:5000 **acriflavine** solution valuable.

Pugh feels certain that there are definite cases of congenital diverticula. A congenital weak spot in the bladder exists in all cases. Pulsion and pelvic adhesions provide the active means of producing the actual sac.

A small illuminating instrument, the "diverticulite," for lighting up diverticula through the operating cystoscope, has been described by W. B. Tatum (Jour. of Urol., Aug., 1927). It is passed well into the opening of, or to the bottom of, the diverticulum, and reveals the condition of the membrane as to infection. A careful study can be made with it in the office, avoiding hospitalization for a cystogram. It is especially useful in cupping or very shallow diverticula, which it shows up well, whereas the cystogram generally does not.

**FISTULA.**—In a case of *enterovesical fistula* reported by R. G. Craig and R. K. Lee-Brown (Surg., Gyn. and Obst., June, 1927), the patient had been passing flatus with urine, and much sediment, for 6 months. One-half inch behind the right ureteral orifice cystoscopy showed a small opening into which 2 opaque ureteral catheters passed without difficulty. Upon introduction of 60 c.c. of 12.5 per cent. sodium iodide solution the patient at once had an urgent desire to defecate and passed a watery motion. The X-ray showed the catheters coiled up in the large bowel,

which was completely outlined in the vicinity by the opaque medium. At **operation**, amid a dense mass of adhesions, a communication between the sigmoid and bladder was found. The **orifice** in the sigmoid was **invaginated** and reinforced by 2 appendices epiploicæ. Some adherent loops of ileum were separated, the raw surfaces peritonealized, and the wound closed in layers, with a rubber-tissue **drain** to Douglas's pouch. The disorder was ascribed to a ruptured appendix, followed by abscess and communication between the intestine and bladder; the tip of the appendix was adherent to the cecum between the bladder and sigmoid, and also to the small bowel. Seven months after the operation the urine was free of pus or sediment, though still showing some motile rods.

**HEMORRHAGE.**—Cessation of hemorrhage from the bladder following **transfusion of 40 c.c. of blood** is reported by R. Andler (Zent. f. Chir., May 22, 1926) in 6 cases. The hemorrhage had been present for 3 to 7 weeks in these patients, and had failed to respond to the ordinary hemostyptic remedies.

**INJURIES.**—Sir William I. de C. Wheeler (Lancet, Aug. 15, 1925) disapproves of the injection of fluid into the bladder for diagnostic purposes in suspected *rupture* on the ground that if the injected fluid does leak through into the peritoneal cavity the shock is increased. Again, even if the fluid returns in full quantity it may have passed through an extra-peritoneal rupture into the space of Retzius and then come back without appreciable diminution, thus misleading the surgeon. The diagnosis of ruptured bladder is not, as a rule,

difficult. There is always a strong but ineffectual desire to urinate. With an inability to void urine, associated with the free passage of a catheter and the return of only small quantities mixed with fresh blood, the case is one for immediate operation.

In **operating**, the writer advises opening the peritoneum at once. The intraperitoneal rupture is the more common, and in dealing with extraperitoneal injury in the presence of blood and extravasated urine and an empty bladder, sufficient room can hardly be obtained by the usual extraperitoneal suprapubic route. If the abdomen contains urine and blood, this may be syphoned off with a simple **aspirator** connected with a water faucet. The rent in the bladder is closed and covered, if possible, with a piece of omentum. A small corrugated **rubber drain** is passed to the line of suture, and a **self-retaining rubber catheter** introduced through the urethra. Where the rupture is not intraperitoneal, the abdominal contents are packed away and the injury is then generally located on the anterior surface of the bare area of the bladder, and should be **sutured**. A tongue-shaped portion of omentum pulled through the line of peritoneal reflection is laid flat over the surface to secure firmer union. A drain is passed into the space of Retzius and the self-retaining catheter inserted. If, as is sometimes the case, the rent is inaccessible for accurate suture and bleeding has been free, **suprapubic drainage** with a tube in the bladder is the procedure of choice.

The writer points out that where there is leakage from a bladder containing healthy urine, the onset of

peritonitis, cellulitis and suppuration, with rigors, fever and toxemic symptoms, may be delayed for 2 or 3 days.

*Late ulceration* of the bladder from *radium* applications to the uterus is discussed by A. L. Dean, Jr. (Jour. Amer. Med. Assoc., Oct. 1, 1926). At least a year elapses between the application of radium in doses exceeding 3500 mc.-hours and the appearance of bladder symptoms. The cause is an obliterative endarteritis. Various clinical features may suggest cancer of the bladder, which is differentiated by a biopsy. The most effective treatment of the many tried by the writer consisted in giving an **alkaline hyoscyamus mixture** by the mouth and practising **instillations of mercurochrome** into the bladder. These measures relieve the symptoms, and the ulceration is allowed to heal in the course of time—several months. Destructive agencies such as fulguration, the actual cautery or further irradiation are contraindicated by the mode of production of the ulceration.

**PRESSURE CONDITIONS.**—Measurements of the pressure in the bladder are of great diagnostic value, according to D. K. Rose (Jour. Amer. Med. Assoc., Jan. 15, 1927), particularly in solving such problems as whether a case of *incontinence* is of neurogenic origin, and if so, which set of nerves is chiefly involved. The writer has devised an instrument called the "cystometer," for measuring the intracystic pressure. It consists of a 15-c.c. syringe encased in a box, which is operable by hand- or foot-pressure, and which by means of a 2-way valve forces a more or less steady stream of fluid through a catheter or cystoscope, each cubic



centimeter of this fluid being recorded within view synchronously with the intracystic pressure. The information supplied is thus the exact intracystic pressure as the organ is being filled, from the 1st cubic centimeter to full capacity. The pressure is measured in millimeters of mercury and the result is registered as a curve between millimeters of mercury and cubic centimeters of fluid. The measurements of bladder pressure with known amounts of fluid give information as to the strength and irritability of the bladder wall and the condition of its motor and sensory innervation. The patient's bladder sensations with the varying intracystic pressures and the associated amounts of fluid are noted. With cystograms of bladder diverticula, the method reveals whether a diverticulum is of an early, small but elastic type, or of longer standing and definitely fixed.

According to T. D. Moore (South. Med. Jour., Feb., 1927), investigation of the intravesical tension with a water manometer yields a somewhat characteristic curve in *atony of the bladder*. Sensory tests of the bladder, revealing varying degrees of anesthesia to tactile, thermal and pain stimuli, also give significant information in atony. Along with slow dribbling from an inserted catheter, the features of atony are marked difficulty in urination; residual urine, usually in large amount, and the absence of any discoverable obstruction to the urinary stream. The pressure studies and sensory tests assist in the differentiation of atony from retention due to obstructive conditions. Futile operations, such as prostatectomy, have been performed on ac-

count of erroneous diagnoses in this connection.

**TUBERCULOSIS.**—A case of *primary* bladder tuberculosis, a rare condition, has been reported by T. Luciri (Policlin., Nov. 1, 1926). Cystoscopy showed an even reddening of the trigonum. Posterior to the left ureteral orifice, which was surrounded by a zone of bulbous edema, was an area of ulceration. Guinea-pigs inoculated with urine from the ureters developed no tuberculous lesions, while that receiving urine from the bladder did. Five months later the same results were obtained. The ulceration had diminished in size, but was now treated by light **fulguration**. Nine months later the urine from the kidneys was still negative.

According to N. Blaustein (Jour. of Urol., May, 1927), *cystography* of the tuberculous bladder yields valuable diagnostic information. The highly acid urine and the products of tuberculous metabolism, being strong irritants, cause increased muscular activity of the ureters and bladder, and from this indirectly there results complete stasis in the capillaries in the musculature, with cell infiltration, fibrous proliferation, and splinting of the muscle tissue. The ultimate picture is that of infiltration, dilatation and rigidity of the ureteral wall, shortening of the ureter, retraction of the ureteral meatus producing the "golf-hole" appearance, and infiltration, organization and fibrosis of the bladder wall on the affected side, producing the typical "incline" bladder.

In advanced vesical tuberculosis, it may be impossible to find 1 ureteral orifice. The finding of areas of apparently normal bladder mucosa here

and there in the presence of severe vesical involvement is believed by A. Fullerton (Irish Jour. of Med. Sci., Jan., 1927) to be almost pathognomonic of tuberculosis. When a positive diagnosis cannot be made, he exposes the ureter through the usual gridiron type of incision. Pyelography is of value, but not entirely devoid of risk.

**TUMORS.—DIAGNOSIS.**—Sudden painless hematuria in an apparently healthy person, as noted by H. Wade (Edinb. Med. Jour., Jan., 1927), is due most probably to a tumor of the bladder. The amount of bleeding ranges from a trace to a profuse hematuria with the passage of large clots. An exact diagnosis of the type of a papillary tumor—benign villous, transitional malignant, or primarily malignant—can be made only by cystoscopy and removal of a specimen with the cystoscopic rongeur. The latter method, however, is not indicated in obviously malignant tumor, and in borderline cases will remove only the outer or benign portion, leaving the beginning malignancy at the base of the tumor untouched. Viewed laterally, the benign villous papilloma may resemble very closely an oak tree. When tissue around its base is roughened, vascular and granular, malignancy is suggested. Later in malignancy the branching disappears and the tumor becomes sessile and ultimately sometimes ulcerated.

Three cases of *inflammatory lesions* of the bladder simulating neoplasm are recorded by J. J. Joelson and W. E. Lower (Surg., Gyn. and Obst., Oct., 1927). In the 1st, a localized tuberculous lesion (tuberculoma) of the bladder wall had resulted from a tuberculous kidney, instead of the usual generalized tuberculous cysti-

tis. In the other 2 cases an inflammatory reaction had been set up in the bladder wall by contiguity from the adnexa uteri, 1 being definitely tuberculous and the other probably so. The symptoms in the 3 cases were dysuria, frequency, nocturia, and pyuria in 2 cases; in 1 case a history of hematuria was obtained. Cystoscopically, in each case there appeared to be a definite tumor. These tumors, however, instead of being papillary, were made up of fairly large, club-shaped villi, some cystic or translucent, and usually of a rosy red hue. There was no invasion of surrounding mucosa nor any ulceration. Taken together, these features may aid in correct diagnosis. In the 1st case, however, the true nature of the lesion was not learned until the microscopic examination. Where the tumor is suspected of not being a true neoplasm, a biopsy is warranted. The possibility of such inflammatory tumors should be kept in mind, especially in women. All of the authors' 3 cases were in women.

**TREATMENT.—Papilloma.**—Reviewing 622 cases of bladder tumors, W. W. Scott and R. W. McKay (N. Y. State Jour. of Med., Sept. 1, 1927) state that benign papillomas always respond to **fulguration** alone, but often disappear much more rapidly when cystoscopic applications of radium are used in addition. These tumors recur, and often it is necessary to have the patients return from time to time for cystoscopy for several years. Malignant papillomas very often respond to fulguration alone, but much more satisfactory results are obtained if the tumor is 1st thoroughly treated by cystoscopic

applications of radium and then fulgurated. These tumors recur more frequently than the benign type, necessitating return for cystoscopy every few months. Wade (*loc. cit.*) notes that in benign papilloma a number of fulguration treatments at intervals of 2 weeks may be required to destroy the tumor completely. If the tumor is too large for fulguration, a **suprapubic cystotomy with removal** of the neoplasm must be done, great care being taken to prevent implantation of tumor cells in the region of the bladder wound. Malignant borderline tumors, he states, should not be fulgurated; the best results are obtained with radium.

G. Craig and R. K. L. Brown (Med. Jour. of Austral., Nov. 5, 1927) endorse treatment by **diathermy** through the cystoscope in small papillomas of the 1st and 2d grades of malignancy. In the 2 more severe grades of bladder growths, diathermy gives better results than even wide excision. **Aspiration** has been found effective by R. Born (Zeit. f. Urol., xx, 250, 1926) in the removal of bladder papillomas. Aspirating crushed stones from a bladder, he found fragments of a large papilloma, which was then largely aspirated by direct application of the evacuating catheter to the growth. The remaining stump of the tumor was destroyed a few days later by electrocoagulation. In another case a papilloma was removed in small fragments by aspiration in 1 minute, with almost no bleeding, and cauterization of the stump was carried out a week later.

**Carcinoma.**—Gradual improvement seems to be taking place in the results of treatment of bladder carcinoma. A fairly widespread preference for **radium**

treatment has been manifesting itself. According to Scott and McKay (*loc. cit.*), *papillary carcinomas*, if not too extensive, usually respond to **radium plus fulguration**, and should 1st be subjected to this combined therapy. In a few cases in which this treatment has failed, the tumor has responded to the **X-ray**. If these methods fail, the tumor should be **resected** if it is in a favorable location; if not, it should be **cauterized** superficially and implanted with radium or treated with **deep diathermy**. All *infiltrating carcinomas*, if favorably located and the patient's general condition permits, should be **resected**. When this is impossible, the combined radium and **deep X-ray** therapy should be tried, and if this fails, the tumor should be treated by **cauterization** and **radium implantation**, if not too extensive. The value of diathermy in infiltrating carcinomas is not yet definitely established. **Deep X-ray**, used alone, has been disappointing as to tumor destruction but of great value in diminishing pain due to nerve involvement.

E. L. Keyes (Jour. Amer. Med. Assoc., Feb. 4, 1928) states that for a number of years he has been chiefly interested in the effect of **radium**, because repeated failure to eradicate tumors by seemingly complete excision showed his inability to recognize how far from the tumor the excision should extend. Radium gives better results than surgery, though not an ideal agent for the control of infiltrating tumors. The method of implanting **radium seeds** 1 cm. apart and of sewing the bladder without drainage is advocated. Metal seeds, by screening the beta rays while transmitting the gamma rays, mini-

mize the bladder spasm due to radium burn by the treatment. Seeds of 1.5 mc. content do not burn the tissues perceptibly unless more than 15 are used, and the writer has several times implanted 20 seeds without exciting post-operative spasms. Re-implantation of a large number of seeds must be done with discretion.

The first requisite for a treatment of bladder tumors is that it should control all papillary carcinomas that are attacked before they have infiltrated the bladder wall sufficiently to cause a visible and palpable solid infiltration. Some tumors are so small and accessible that they may be destroyed by repeated cystoscopic treatments. But if the bladder has to be opened, as is commonly the case, prompt post-operative diagnosis and treatment (when required) can be assured only by suturing the bladder without drainage, or inverting the bladder wall about a small drainage tube, so that within a month the post-operative cystitis shall have cleared sufficiently to permit of cystoscopy with a fair prospect of discovering—and proving by biopsy—persistence or recrudescence of tumor.

B. S. Barringer (*ibid.*) tabulates the end-results in 71 cases in which 5 years had elapsed since radium treatment. Of 20 patients with *papillary carcinoma*, 15, or 75 per cent., were cancer-free for as long as observed (2 to 11 years), and 11 had remained so for more than 5 years. Of 51 patients with *infiltrating carcinoma*, 18, or 35 per cent., were cancer-free for as long as observed (3 to 11 years), and 12 had remained so for more than 5 years. Many of the infiltrating cases were very extensive, and most of them involved the bladder base.

In this series radium in all forms was used, beginning in 1915 with radium tubes left in the bladder, then more accurately with cystoscopic applicators and implanted glass seeds, and later radium seeds applied through the open bladder. In none of the series was the latest development, gold seeds, used; with the advent of these, the effectiveness of radium in bladder growths has decidedly increased, and future results should improve. Among 94 suprapubic implantations of radium, there was a mortality of slightly over 3 per cent., 3 days to 3 months after the operation; this compares with the mortality of 10 to 20 per cent. resulting from operative removal of bladder cancer.

In implanting radium, the writer avoids spilling the infected bladder contents by emptying the organ with an aspirating device, padding the wound well, and removing any soiled pads after the bladder is empty. Preliminary to implantation, protruding parts of the tumor are removed with the **electric cautery**, minimizing hemorrhage and controlling infection. If the tumor is large, bleeding has been marked, or the bladder is badly infected, a rubber **drainage tube** is inserted, and removed when bleeding has stopped or the infection is controlled. Gold **radium seeds** of about 2 mc. are implanted 1.5 cm. apart throughout the base of the growth. All of the writer's operations are done under **local anesthesia** over the bladder and a low **spinal anesthesia**. He has seen cases recur after 6 years, but none later than that.

E. Beer (*ibid.*) disagrees in some respects with Barringer and states that in over 400 cases treated with **radium**



the results did not compare with those reported by Barringer, either as to immediate mortality or end-results. In *papillary carcinoma*, small tumors can occasionally be destroyed with the **high frequency current**. If the response to this measure is not favorable, **operative removal** is indicated. In 28 such cases the operative mortality was 14 per cent. and the recurrences 25 per cent. Over 60 per cent. of those surviving the operation appear to be cured. In *infiltrating carcinoma*, **resection**, whenever possible, is favored. If impossible, **radium** can be used. In these cases the operative mortality was 21 per cent., and recurrences occurred in 55 per cent. of those surviving the operation, the remaining 45 per cent. seeming to be cured. In 16 cases in which **radium seeds** were introduced through the cystoscope (without mortality), 8 were apparently cured and 8 recurred. In 31 cases in which resection was impossible and radium had to be applied there was a mortality of 33 per cent., and 6 cases (30 per cent.) were apparently controlled. From **deep X-ray therapy** in primary bladder tumors Beer has not had a single cure.

A. C. Morson (Brit. Jour. of Radiol., Sept., 1927) states that the response to **radium** varies with the type of growth, the best results being obtained with the ulcerative variety and the worst with the cauliflower-like lesion. It is the tumor which contains cell nests that can be relied on to shrink under the irradiation.

The results accruing from the use of physical agents in bladder tumors are steadily getting better, according to Beer (Amer. Jour. of Surg., Feb., 1928). Aside from the use of radium seeds, he refers to various modalities

of the **high frequency currents** applied through the cystoscope; use of these currents through the opened bladder combined with **alcohol** to prevent implantations; bladder **resections** with the **radio-knife** actuated by a very rapidly oscillating (1,200,000) high frequency current, and **deep X-ray therapy**.

In the **coagulation** treatment of bladder tumors, W. Walters (Jour. Amer. Med. Assoc., Feb. 4, 1928) notes that a severe toxemia is often set up which extends to the gastrointestinal tract, as evidenced by high elevation of the blood urea and by alkalosis. This can be controlled by the **intravenous use of sodium chloride** solution in large amounts, which will stimulate intestinal peristalsis, and by the frequent use of the **stomach tube**. If these methods fail, **cecostomy** is of great advantage in relieving the gastrointestinal tract of flatus (Hunt).

**Total excision** of the bladder should rarely be performed, according to L. Simon (Beitr. z. klin. Chir., cxxxvi, 565, 1926), in view of the great regenerative powers of the human bladder. In 1 case all but the trigone and ureteral orifices with a margin 1 cm. wide had been removed; yet 6 months later the bladder held 200 c.c. and after 2 years, 300 c.c. Of 50 cases of bladder cancer operated on between 1916 and 1923, 24 were alive in 1926 and 26 had died. Of those surviving,  $\frac{1}{2}$  had lived longer than 5 years. In 12 of the 26 dead, a radical operation was impossible. In 18 of the 24 still living, 1 operation had sufficed; in the other 6, repeated **resections** or **electrocoagulations** had been required. In bladder resection the writer operated extraperitoneally when possible. Resections should be carried out at least  $1\frac{1}{2}$  cm. ( $\frac{3}{8}$  inch) from the pedicle of the tumor. The

writer strongly favors post-operative radiation.

According to C. A. Waters (Amer. Jour. of Roentgenol., Sept., 1926), **deep X-ray therapy**, with close co-operation of the urologist and roentgenologist, affords a relief of *root pains* and *hematuria* in inoperable cases that justifies its use.

**ULCER.**—Chronic inflammatory ulcerations of the bladder are grouped by Keyes (Cornell Univ. Med. Bull., xvi, 167, 1927) into 3 classes—tuberculous ulcers, ulcers of the so-called Hunner or elusive type, and incrustated ulcers. The *incrustated ulcer* seems due to a special coccic infection often located on the trigone and about the bladder neck, often clinically and cystoscopically simulating carcinoma, yet often readily curable by local applications of **argyrol** or **acidophilus** or **Bulgarian bacillus**. The *elusive ulcer*, occurring in the mobile part of the bladder, away from the trigone and urethra, is sometimes associated with tuberculosis, sometimes with generalized cystitis and pyelitis. It is not yet proven that the submucous lesion is not rather the remnant of an acute generalized cystitis than a specific entity. Hence the great variety of treatments that succeed in individual cases. **Operation** has a place of last resort to get rid of ulcers with great chronic infiltration. The bladder lesion of chronic *tuberculous* cystitis may be a pure tuberculosis, but is more often a mixed infection. Discreet treatment of the bladder may, even in the presence of tuberculosis of the prostate and of the remaining kidney, marvelously relieve the symptoms. In certain bladders, however, the mixed infection seems to super-

sede the tuberculosis partly or wholly and the lesions conform to the type of elusive ulcer.

Among 35 instances of *elusive ulcer* treated by H. L. Kretschmer (Jour. Amer. Med. Assoc., Mar. 13, 1926), 11 were subjected to wide *resection* of the ulcer-bearing area. Of these, 6 were completely relieved, 1 improved, while 4 later had distress similar to that previously experienced. One of these cases with recurrence was later cured by **fulguration**. Of 24 patients treated only by fulguration through the cystoscope, 6 were cured, 16 so improved as to require no further treatment, 1 still under treatment, and 1 not traced. While at 1st sight fulguration would accordingly seem to be the treatment of choice, some of the patients so treated have an aggravation of symptoms on such slight provocation as an intercurrent infection or fatigue. **Silver nitrate instillations** gave much relief, but no cures. Of 44 cases of elusive ulcer, only 4 were in males.

**BLASTOMYCOSIS.**—Reporting 2 cases of primary pulmonary blastomycosis, E. M. Medlar (Amer. Jour. of Path., July, 1927) lays stress on the identity of the gross and microscopic changes in fungus and tuberculous infections. In the clinical and X-ray study of lung lesions the possibility of fungus infection as well as tuberculosis should be kept in mind. Similarly, W. S. Miller (*ibid.*), having studied the lung reticulum in blastomycosis and tuberculosis, asserts that the lesions produced by the 2 organisms cannot be differentiated apart from the presence of the organisms themselves.

In a case of systemic blastomycosis

reported by J. B. Cleland (Med. Jour. of Austral., Mar. 5, 1927), there was a myxomatous-looking tumor-like mass in the right iliac region, at first thought to be an inoperable sarcoma. On microscopic examination it was found to contain numbers of a yeast-like organism.

**TREATMENT.**—E. S. Sanderson and D. C. Smith (Arch. of Derm. and Syph., Aug., 1927) find that extremely dilute solutions of **gentian-violet** possess a marked inhibitory effect on the yeast-like organisms of blastomycosis. The dye may possibly be utilized in the treatment of this disease in man.

**BLEPHARITIS.**—In 150 cases of staphylococcic infection of the eyelids, refractory to ordinary measures, P. E. Kissine (C. r. Soc. de biol., June 4, 1926) applied once or twice daily an ointment consisting of 15 to 300 Gm. ( $\frac{1}{2}$  to 10 ounces) of Besredka's **filtrate of staphylococci** isolated from the eyelid lesions, in a vehicle of petrolatum and lanolin, of each 50 Gm. ( $1\frac{2}{3}$  ounces). Cure resulted in 45 per cent. and marked improvement in 47 per cent. In the remaining 8 per cent., in which the treatment failed, obstinate eczema was present as a complication of the blepharitis. Of 9 cases of recurring **styes**, 3 were cured in 3 weeks, remaining free of styes in the succeeding 6 months.

**BLOOD. — ERYTHROCYTES.**—**Diameter.**—During spontaneous remissions in pernicious anemia the diameter of the red cells was found by D. N. Medearis and G. R. Minot (Jour. of Clin. Invest., Feb., 1927) to become normal, or even sometimes less than normal. In 9 cases of chronic myelogenous leukemia and 2 of subacute

aleukemic myelogenous leukemia the red cells were small in diameter; in 1 instance, however, a well-marked increase in size occurred during the latter part of the disease.

**Blood Stains.**—The Kastle-Meyer test for occult blood in the feces has been applied by J. Glaister (Brit. Med. Jour., Apr. 10, 1926) to the examination of blood stains from the medicolegal standpoint. A mixture of 2 Gm. of phenolphthalein and 20 Gm. of potassium hydrate is boiled with distilled water, to make 100 c.c., and 10 to 30 Gm. of powdered zinc are added during the process. The boiling is continued until the solution becomes colorless. In making a test, 10 to 20 drops of the Kastle-Meyer reagent are placed on the suspected blood stain, and then a few drops of fresh hydrogen peroxide solution added. In the presence of blood a deep permanganate color develops almost at once. The delicacy of this test is not affected by the age of the stain. On account of the sensitiveness of the test, extraneous contamination must be rigidly excluded. The test may be appropriately employed in conjunction with microscopic examination of the stain and the precipitin or serologic test for the source of the blood.

**Sedimentation Test.**—An improved technic for this test is described by J. Cutler (Amer. Jour. Med. Sci., June, 1926). After applying a tourniquet to the arm, he aspirates into a syringe 0.5 c.c. of 3 per cent. sodium citrate solution, punctures the cubital vein and draws blood to the 5 c.c. mark. The tourniquet having been released and the needle withdrawn from the vein, the barrel of the syringe is drawn out about 1 cm. and the blood and citrate solution mixed by tilting back and forth. The needle is removed from the syringe and the contents of the latter poured into the sedimentation tube, which is graduated from the bottom up in millimeters up to 50 mm. Before any reading is made the tube is stoppered with a paraffine-coated cork and gently turned upside down 2 or 3 times. The tubes can be allowed to stand as long as 10 hours before making any readings without losing valuable information, but after this time the sedimentation phenomenon begins to disappear. In his illustrations the author shows the level of the red cells at the start

and 15, 30, 45 and 60 minutes later. For each case he constructs a graph or chart showing not only the distance the cells sediment, but also the rapidity with which they sediment in an hour's time. Such curves have definite clinical importance in *pulmonary tuberculosis*. By repeating the test at regular intervals the true course of tuberculosis can be graphically shown; as the patient improves the curve approaches more and more the horizontal line, but if he becomes worse, more and more a vertical curve, owing to the increasing distance of descent per unit of time.

According to J. L. Baer and R. A. Reis (Amer. Jour. of Obst. and Gyn., Nov., 1926), the test is more useful in *gynecology* than the temperature curve or the leukocyte count in determining the presence or absence of infection. A sedimentation time of more than 2 hours rules out infection in a *pelvic pathologic condition*. The test is a further aid in determining the safe time for operation, 60 minutes being the lower limit of safety. As a prognostic index, the test is more delicate than either the leukocyte count or the temperature curve.

From a study of the test in *pulmonary tuberculosis*, R. C. Wingfield and R. Goodman (Lancet, Oct. 16, 1926) concluded that when close clinical observation of the patient is possible the test is of little value. But many cases have to be treated without such close observation, *e.g.*, in the outpatient department, dispensary or private practice. Under these conditions the test is of value in showing, *e.g.*, whether a patient is holding his own or not, and whether one is justified in putting him to the trouble and expense of undergoing a more drastic form of treatment.

After observation of nearly 650 cases, in which 1660 readings were made before and after operation, J. O. Polak and D. G. Tollefson (Jour. Amer. Med. Assoc., Jan. 21, 1928) have come to regard the sedimentation test as the best means of diagnosis in *latent infection*. It is more sensitive and valuable than the leukocyte count and other tests. A low reading means infection and a high reading means that infection can be excluded, for "sedimentation never lies." A reading exceeding 160 minutes excludes infection. With a time less than 30 minutes, localized collections of pus or purulent material

were constant. In 7 cases of *pelvic abscess* the time ranged from 8 to 21 minutes. Of 28 cases of *tubo-ovarian disease* in which the time ranged from 16 to 171 minutes, 12 cases showing an average of 150 minutes were found healed. After an acute exacerbation, if the readings are below 70 minutes, regardless of the temperature range or leukocyte count, these cases must be considered to contain a quiescent infection which may be activated by operative interference. With a history suggesting *ectopic pregnancy*, at the onset of the 1st attack of pain a sedimentation time exceeding 100 minutes is of great value as a confirmatory diagnostic factor. In uncomplicated *fibroids* the readings average 225 minutes; in fibroids with pelvic infection they are invariably below 120 minutes. In laparotomies for *pelvic infection*, when the time is below 90 minutes the morbidity is increased, complications are more numerous, and convalescence is more prolonged. *Hysterectomy* with pelvic infection has a grave potentiality where the time is below 90 minutes. The writers have frequently made a diagnosis of *impending wound infection*, *stump infection* and *pelvic exudate* without an associated leukocytosis or elevation of temperature. A patient with a time below 45 minutes should not be discharged from the hospital but given a longer period to convalesce and absorb the exudate. It should be noted that in physiologic conditions of *pregnancy* and the *puerperium* low readings are without significance, not being explainable by infection when these conditions exist.

**Cell Count.**—An increase of the red cells by 500,000 to 2,000,000 was observed by H. Zondek and G. Kochler (Klin. Woch., May 14, 1926) following within ½ hour after the administration of 0.1 to 0.3 Gm. (1½ to 5 grains) of desiccated *thyroid gland*. Some individuals, however, respond with a decrease, especially during the winter; anemia persisting 10 to 12 days could be induced by giving the drug. Some cases of *polycythemia* were favorably affected by it, probably through enlargement of the spleen and retention of red cells in it.

**HEMOGLOBIN.**—T. E. Buckman (Amer. Jour. Dis. of Childr., Feb., 1925) notes that it has long been realized that the diminution of CO<sub>2</sub> tension in the



lungs is not a satisfactory explanation of the evacuation of CO<sub>2</sub> from the blood. This phenomenon has at last been elucidated by Henderson, who has shown that as the hemoglobin becomes oxygenated it becomes sufficiently acid to liberate CO<sub>2</sub> from its combination with base, the latter then combining with hemoglobin. The reverse change takes place in the tissues, where the increased tension of CO<sub>2</sub> is sufficient to drive off the oxygen from the blood, thus liberating base for combination with CO<sub>2</sub>. Henderson and Haggard have shown, furthermore, that the red corpuscles are capable of manufacturing bicarbonate when placed in a solution of sodium chloride. They thus become an important part of the neutrality-regulating mechanism of the blood. As the CO<sub>2</sub> tension to which the blood is exposed increases, more bicarbonate is formed, so that the ratio between combined and dissolved CO<sub>2</sub> in the blood may be maintained constant within wide limits of CO<sub>2</sub> tension. It has long been known that with increasing CO<sub>2</sub> tension, chloride ions pass from plasma to corpuscles, coincidentally with an increased bicarbonate content of the plasma. This phenomenon has never been satisfactorily explained.

**LEUKOCYTES.**—Lippman is quoted by Buckman (*loc. cit.*) to the effect that the total leukocyte count at birth averages 16,000. At 12 hours it is 22,500, after which it gradually drops to 11,300 at 48 hours and to 9500 in 5 days. The polymorphonuclear leukocyte count, in absolute numbers, follows closely the total leukocyte count, while the absolute values of the lymphocytes vary little during the first 5 days. The relative and absolute values of lymphocytes and neutrophils are equal at 48 hours. After this, the values for the lymphocytes increase while those for the neutrophils decrease. Mononuclears and transitionals are present in the same percentages as in later life. The eosinophils gradually rise in number until 36 hours after birth and then become less numerous. The average variability of the total leukocyte count was about 25 per cent., and of the neutrophils and lymphocytes about 35 per cent. The average variability of the red cell count was only 11 per cent. The increase in whites and reds in early life is

taken by Lippman to mean increased activity of the hematopoietic organs. Strangely, the platelets do not share in the process.

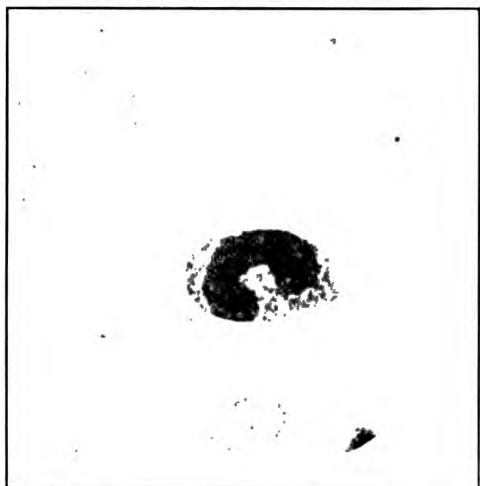
Valuable diagnostic results from blood examinations in *abdominal inflammations* are described by John (Münch. med. Woch., Oct. 9, 1925). Thus, a marked "shift to the left" with, *e.g.*, 22 per cent. of neutrophils having S-shaped nuclei and aneosinophilia, points to a purulent process, such as appendicitis, even in the absence of fever and with little in the way of symptoms. A dangerous inflammatory condition is excluded by negative blood findings, which may suggest that simple colic is present.

Along similar lines, F. Bauer (Beitr. z. klin. Chir., cxxxvii, 430, 1926) reports a case of severe pains in the right side of the abdomen in a patient who had sustained a blow from a jutting ledge in this region 3 weeks after an operation for appendicitis. In spite of certain suggestive symptoms, the blood-picture did not indicate injury, and a diagnosis of neurosis was made. Again, blood changes may be the earliest indication of an urgent need for operation. In a case of *strangulated femoral hernia* in which the symptoms did not suggest an emergency, a low leukocyte count with marked shift to the left showed that the body was making a losing fight against a severe infection. A progressive shift to the left after operation is of grave prognostic portent, regardless of apparent clinical improvement, while a cessation of the shift means improvement even if the blood-picture *per se* is bad. In a case of *suspected gastric cancer*, the X-ray was not confirmatory and the lymphocyte and mononuclear counts suggested a tuberculous process, in spite of the acute symptoms. At the autopsy bilateral tuberculosis of the adrenals was found, accounting for the acuteness of the symptoms.

Arneth (Klin. Woch., July 23, 1927) finds experimentally that marked qualitative changes in the leukocytes occur very soon after inoculation of bacteria, whereas the total leukocyte count may remain normal or unchanged.

According to A. Weiss (Amer. Jour. Med. Sci., July, 1927), *Arneth's method* of clinical classification of the neutrophils was never generally applied because the process of examination of the cells is too

time-consuming and even difficult. He endorses *Schilling's modification* of Arneth's procedure, whereby the neutrophils with nuclei showing 2, 3, 4 or 5 segments are simply classed together as segmented forms, while the non-segmented forms are divided into the metamyelocyte of Pappenheim (with nearly circular or kidney-shaped nucleus), the "jungkernige" and the "stabskernige," the staff or rod form. Further, Schilling, instead of especially dividing 100 picked neutrophils into the Arneth subclasses as a separate procedure, incorporates the examination in the ordinary differential count of 100 cells, thus reducing the time



Staff or rod form of neutrophile leukocyte.  
(Weiss, in *Amer. Jour. Med. Sci.*)

taken by the procedure to 5 minutes. Pons and Krumbhaar advocate a further simplification whereby the jungkernige and stabskernige are combined as young forms, thus adding only 2 extra groups to the ordinary differential count, of which 2 the metamyelocyte seldom occurs in normal blood.

From 100 blood examinations with the simplified procedure, Weiss concludes that with the height of an infection there is a concomitant peak in the immature (non-segmented) leukocytes. As convalescence sets in there is a drop in the staff forms to the normal 3 to 5 per cent. Persistence of the high level of staff forms means some complication. Crisis in *pneumonia* is very often accompanied by a staff count approaching 50 per cent. of the total leuko-

cyte count. Presence of a count nearing 50 per cent. of immature forms during the early days of a pneumonia means generally a fatal prognosis. The chart of the immature cells often coincides more accurately with the course of the illness than the temperature. The percentage of immature cells is by far more valuable than the total leukocyte count or the percentage of neutrophils. In following a clinical case a complete count can be done in the morning and thereafter smears taken every 2 or 3 hours if necessary and the differentials done at one's leisure. Because of the large percentage of error encountered in consecutive total leukocyte counts, and because the writer has found such counts of less value than the percentage of staff forms, he often simply makes one total count and then follows the case by its differentials.

**PLATELETS.**—The thrombocytes or blood platelets are believed by Wright to be derived from the megakaryocytes of the bone marrow. Discussing their relationship to *hemorrhagic diseases*, I. W. Held (*Arch. of Int. Med.*, Mar., 1926) points out that a slowing up of the blood-stream causes the thrombocytes to adhere to the walls of the vessels and is thus responsible for *thrombosis intra vitam* in cases of circulatory weakness. Wherever there is a foreign body in the tissues the thrombocytes collect around it. They have an agglutinative property whereby they rapidly adhere to cut or injured surfaces of tissues, with consequent thrombus formation. The minimum number of thrombocytes necessary for this adhesive property is low compared to the number of platelets encountered in the condition known as *essential thrombocytopenia*. Their agglutinative power also explains the retractile property of the blood-clot and the presence of a non-retractile blood-clot if the thrombocytes are greatly diminished. According to Bordet, the thrombocytes also furnish a cytozyme that causes blood-clot formation.

**COAGULATION.**—A method for determination of the coagulation time which is simple, requires a minimal amount of blood, and gives the opportunity to determine the retractibility of the clot is described by J. W. Sooy and T. S. Moise (*Jour. of Lab. and Clin. Med.*, Aug., 1927). Capillary tubes 3 cm. long and with an internal dia-

meter of 0.2 to 0.3 mm. are used. The skin is carefully cleansed and dried with alcohol and ether. The puncture is made sufficiently deep to obtain a free flow of several drops of blood. The capillary tube is held by forceps and the 1st drop of blood is drawn by capillary attraction into the tube. The latter is placed on a clean slide and observed with low-power magnification and the ocular micrometer. The time of puncture is recorded. After an average of 2 minutes and 44 seconds a thin opaque line appears between the blood and the walls of the tube. After about 4 minutes and 15 seconds a serrate outline gradually appears and becomes wider. After about 8 minutes, the blood begins to retract from the walls of the tube. This is considered the coagulation time. The retraction continues for about 35 to 45 minutes. Observations are made at short intervals, and the time at which retraction ceases is considered the time of complete retraction. The average retraction time for normal persons is 36 minutes.

According to A. Partos (Deut. med. Woch., Oct. 28, 1927), the *sugar content* of the blood plays an important part in coagulation. In experiments in which the blood sugar was raised or lowered by various expedients, the coagulation time shortened as the blood sugar content increased, and grew longer as the sugar values fell. Alimentary hyperglycemia in animals shortened the coagulation time, as did intravenous injection of glucose. The writer maintains that all substances which affect coagulation first induce a change in glycogen mobilization, which causes a change in the blood sugar content. Added sugar content stimulates the liver and causes an increased production of fibrinogen in the blood.

Hirayama (Tohoku Jour. of Exp. Med., June 28, 1925) found that in rabbits coagulation was retarded by small doses (0.001 mgm. per kilo.) or by large doses (0.05 to 0.1 mgm. per kilo.) of *adrenalin*, given intravenously, while it was accelerated in over  $\frac{1}{2}$  the cases by intermediate doses (0.01 to 0.03 per kilo.).

**BLOOD CHEMISTRY.—NITROGENOUS COMPOUNDS.**—Discussing the blood chemistry of *chronic nephritis*, H. Jackson, Jr. (Boston Med. and Surg Jour., Jan. 8, 1925) notes that the determination

of the total *non-protein nitrogen* is an easy and excellent routine procedure, giving about all the information possible as regards nitrogenous compounds. Normally it amounts to 25 to 40 mgm. per 100 c.c. of blood. If it is normal it does not exclude nephritis, while if it is high, Bright's disease is not necessarily present, as this may occur in many other conditions. If the latter can be excluded, a high non-protein nitrogen means nephritis of considerable severity. Practically, the blood *urea nitrogen* parallels the non-protein nitrogen. It is normally 35 to 55 per cent. of the total non-protein nitrogen, but in cases of very great retention it may form 75 per cent. of the total. In competent hands the determination of urea nitrogen is quite simple, but in inexperienced hands it may prove extremely treacherous. As for the determination of the blood *uric acid*, to interpret the figures properly one must know what method was used, as the results vary from 2.5 mgm. with the Folin 1913 method to 4.5 mgm. with the Folin or Benedict latest modification. This determination cannot be considered as the most reliable indication of renal disease, as the uric acid is raised in many conditions other than Bright's disease and may be normal or nearly so in advanced cases of it. The uric acid may be increased in eczema and during starvation. The blood *creatinin* is of some importance, especially in prognosis. In health it ranges from 1.2 to 1.5 mgm. per 100 c.c. of blood. A markedly raised creatinin content indicates a bad prognosis; if the figure exceeds 5 the outlook is very grave. The *amino-acid nitrogen* and *nucleoproteid nitrogen* determination have no practical significance in nephritis. Again, the importance of the *total plasma protein* is more theoretical than practical. In "nephrosis" and to a less extent in the nephrotic type of glomerulonephritis there is a true and absolute reduction of the total plasma protein to as low as 3 or 4 Gm. per 100 c.c. (normal, 6.5 to 7.5), which is not dependent upon dilution of the blood coincident with the general anasarca.

The blood *urea*, as noted by L. L. and E. M. MacKay (Jour. of Clin. Invest., Apr., 1927), is normally subject to considerable variation according to the rates of urea formation and excretion. The upper limit

of normal, however, is comparatively low as long as there is a sufficient amount of functioning renal tissue. To ascertain just how great the loss of renal tissue must be to produce the high blood urea frequently found in the terminal stages of nephritis, the writers applied Addis's method of functioning renal tissue determination. It was found that the blood urea concentration did not begin to rise markedly until the active kidney tissue was reduced to about  $\frac{1}{2}$  its original amount.

E. Becher (Zent. f. inn. Med., Apr. 10, 1926) finds that in *leukemias* with high leukocyte counts the combined and free amino-nitrogen is greatly increased in the de-albuminized total blood. This increase is due to an excess of amino-nitrogen in the leukocytes. In *polycythemia* the amino-nitrogen may likewise be increased, by reason of the increase in the red cells; the latter contain more amino-nitrogen than the blood plasma. In *pernicious anemia* the products of intestinal decomposition, indican and phenol, occur in the blood.

**CHOLESTEROL.**—Much has been written on this blood constituent of late. R. Pilatre-Jacquín (Med. Press and Circ., June 30, 1926) states that normally the blood plasma contains 1.4 to 1.9 Gm. of cholesterol per liter. The blood cholesterol is increased in *pregnancy* and markedly diminished in the fully-developed stage of *infectious diseases*, including, in particular, the exacerbations of *tuberculosis*. Hypercholesterolemia is of favorable import, indicating healthy functioning of the endocrins, while hypocholesterolemia is unfavorable. Active hypercholesterolemia is ascribed to increased activity of the adrenals or ovaries, while passive hypercholesterolemia follows disease of the liver with disturbance of the biliary function of the latter; the insufficient liver, unable to eliminate and destroy normally the blood cholesterol, allows a retention hypercholesterolemia, usually running parallel to bilirubinemia and cholemia. In *obstructive jaundice* the writer has met with 15 Gm. of cholesterol to the liter of serum. In *hemolytic jaundice* the cholesterol level is normal; likewise in ordinary cirrhosis. In *gall-stones* the bile cholesterol is precipitated, the blood cholesterol usually remaining normal. In *chronic parenchymatous nephritis* the cholesterol is

usually increased, and it may even exceed 15 Gm., but there are many exceptions. *Arteriosclerosis* may also be attended with high blood cholesterol.

Barmvater (Hospitalstid., Mar. 31, 1927), using Grigaut's method, places the normal cholesterol content of the blood serum at 0.202 per cent. In *exophthalmic goiter* he found the values low or nearly normal. In *nephritis* normal values were sometimes found, but in nephroses they sometimes reached 0.6 per cent. In *anemias* and *leukemias* the values were particularly low, down to 0.05 per cent.

In *children*, A. Goldbloom and R. Gottlieb (Can. Med. Assoc. Jour., Nov., 1927) found the cholesterol content of *whole blood* to be between 200 and 300 mgm. per 100 c.c. in infants from birth to 6 months, between 200 and 225 mgm. between 6 months and 2 years, and between 175 and 200 mgm. from 3 years up. The relatively high cholesterol in infants is maintained even in diseases where cholesterol is increased, such as typhoid fever and eczema. The highest increase was observed in *typhoid fever*, and a moderate increase in *streptococcus infections*. The cholesterol is increased in *cretinism* when thyroid is not given. It is not increased in all infections, e.g., in acute suppurative arthritis and bronchopneumonia. The lowest values were found in *chronic bone tuberculosis*, *celiac disease* and *amyloid disease*.

In 101 subjects of various ages examined by Roffo (Bol. del Inst. de Med. Exp., Feb., 1926), the blood cholesterol was found to increase with age from the 1st year up to the cancer age (4th to 6th decades), after which it decreased. In *pregnancy* the cholesterol level is that of the cancer age—a possible factor in the rapid progress of cancer in the pregnant. The same observer (Prensa med. Argent., Apr. 10, 1925) reports a steady and synchronous increase of the blood cholesterol content and hemolytic power of the blood with advancing age in animals. In the eel he found 6.836 per 1000 of cholesterol; in the fowl, 1.7; in the dog, 1.292, and in the guinea-pig, 0.383.

Parturier (Bull. de l'Acad. de méd., Apr. 7, 1925) found in guinea-pigs that *heat* increased, while *cold* decreased, the blood cholesterol. Where *oxygen* was added to the air breathed, however, the effect of the



heat was annulled in  $\frac{3}{4}$  of the tests. According to researches by Landau (Ann. de méd., Aug., 1925) in 16 persons, *food free* of carbohydrates but rich in cholesterol increases both the cholesterol and sugar in the blood. Injection of *adrenalin* or ingestion of a large amount of *sugar*, increasing the blood sugar, diminished the cholesterol. *Hunger*, in the 1st 36 hours, lowered the blood and increased the cholesterol. On the other hand, A. Mahler (Jour. of Biol. Chem., Aug., 1926) states the definite rise in blood cholesterol occurring in *ether anesthesia* in man is roughly proportional to the rise in the blood glucose and the duration of the anesthesia. If insulin is given several hours before the anesthetic, no material rise in blood cholesterol or glucose occurs. The effect of ether is ascribed to a partial suppression of the internal secretion of the pancreas. Insulin is regarded as 1 of the factors controlling the blood cholesterol content.

**INORGANIC CONSTITUENTS.**—According to A. S. Blumgarten and G. Rohdenburg (Arch. of Int. Med., Mar., 1927), *sodium* makes up 40 to 55 per cent. of the mineral salt content of the blood; *potassium*, 35 to 45 per cent.; *calcium*, 2 to 3 per cent., and *magnesium*, 1 to 1.5 per cent. The *total salts* amount to 250 to 300 mgm. per 100 c.c. Sodium and potassium have a certain reciprocal relationship whereby when 1 is increased the other diminishes. In cancer, leukemia and purpura hemorrhagica there is associated a marked disturbance of the circulating mineral salts. In *cancer* the magnesium and calcium were found very low, while in *leukemia* and *purpura hemorrhagica* the potassium was low. *Chronic nephritis* showed high sodium and low calcium. High magnesium figures were found in *arteriosclerosis* and in *old individuals*.

**CHLORIDES.**—Impoverishment of the body chlorides has come into notice of late as a clinically important condition. As recently stated (Current Comment, Jour. Amer. Med. Assoc., lxxxvii, 2003, 1926), the chloride ions find their way into the alimentary tract in the gastric juice and also in the intestinal secretions, but this quota is returned normally through reabsorption to the blood-stream. When, however, situations are created that prevent these usual sequences of chloride migration in the body,

undesirable upsets may ensue. Thus, the blood chemical changes attending *high intestinal stasis* and *acute duodenal fistula* consist of increasing alkalosis, decreasing concentration of chlorides in the serum, and progressive rise of blood urea. The alkalosis resulting from *gastric fistula* is ascribed to a loss of acid from the stomach, with liberation of corresponding amounts of alkali. Giving a 1 per cent. solution of sodium chloride appears to avert, in some measure at least, the symptoms resulting from these conditions. Reduction of blood chlorides sometimes occurs from their excretion into the bowel. Introduction of concentrated salt solutions is not effective in the way that the more dilute solutions are.

**CALCIUM.**—Many cases of *chronic interstitial nephritis* with muscular twitchings or convulsions show serum calcium values below 7 mgm. per 100 c.c., according to H. W. Schmitz, E. L. Rohdenburg and V. C. Myers (Arch. of Int. Med., Feb., 1926). In individual cases one notes a gradual fall in the calcium with a rise in the inorganic phosphorus. There is little doubt about the reliability of inorganic phosphorus retention as a prognostic sign in chronic nephritis, but the creatinin is equally reliable and its retention appears to occur a little earlier.

L. Nelken and H. Steinitz (Zent. f. inn. Med., Aug. 21, 1926) similarly state that in a majority of the severe renal diseases there is diminished blood calcium content. This is not due to the thinning of the blood. Almost all the cases with low calcium show high residual nitrogen values. Moderate increases of the residual nitrogen are occasionally associated with normal calcium values. In each of 14 cases of true *azotemic uremia* lowered calcium, often pronounced, was demonstrable. The calcium content was normal, on the other hand, in eclamptic and other pseudo-uremias. In many cases of severe renal diseases an increase of the potassium content of the serum was demonstrable; frequently this increase ran parallel with a diminution of the calcium values.

Reporting a study of the inorganic blood constituents after the injection of *parathyroid extract*, D. W. Wilson and C. Riesel (Proc. Phys. Soc. of Phila.; Amer. Jour. Med. Sci., Jan., 1927) note that Collip's

parathyroid extract, repeatedly injected, will even double the blood calcium in normal animals. There is also an increase in the inorganic phosphate of the serum and a decrease in serum chloride. Accompanying these changes the writers observed also a fall of sodium and a delayed rise of potassium. In the blood corpuscles the sodium diminishes and potassium rises parallel with the changes in the serum. There is an unusually large loss of sodium chloride from the blood without a corresponding loss of water. A. Cantarow, S. M. Dodek and B. Gordon (Arch. of Int. Med., Aug., 1927) show that there is a wide variation in the calcium content of whole blood in *jaundice* as compared with that of normal blood. After giving 15 units of parathyroid extract, however, at the end of 12 hours the blood calcium corresponds almost exactly to that of normal persons treated in the same manner. The extract acts as a mobilizer of calcium and in *jaundice* tends to restore its normal distribution and functional availability. The tendency toward slow, protracted hemorrhage noted when the tissues are incised in the presence of *jaundice* may thus be lessened.

**PHOSPHATES.**—From studies of the inorganic blood phosphate in rats, E. M. Koch and M. H. Cahan (Amer. Jour. Dis. of Childr., Aug., 1927) concluded that while *codliver oil* raises the phosphates in rats receiving a rachitic diet to approximately normal, and direct *irradiation* of the animal and the feeding of *irradiated cholesterol* have some influence in raising blood phosphate, it is still possible to obtain a low phosphorus value and a low product, phosphorus  $\times$  calcium, in an animal which, so far as roentgenograms and histologic examinations can demonstrate, shows perfect calcification of the bones.

**BLOOD-PRESSURE.**—G. L. Gullard (Brit. Med. Jour., Feb. 26, 1927) holds to the rule that the standard systolic pressure equals 120 mm. plus  $\frac{1}{2}$  the age. In life insurance work he depends upon the systolic figure. The diastolic pressure as yet does not give much information. As for the pulse pressure, the wide pulse

pressure of aortic incompetence and the narrow one of chronic interstitial nephritis are now the only indications of much service. In addition to the organic causes of hypertension, such as arterial and renal disease, obesity, worry, sleeplessness and recent or prolonged physical or mental strain all tend to raise the pressure and should be investigated by the examiner. Little is gained by trying to distinguish between hyperpiesis and organic arterial change; in any case continuance of the former will certainly go on to the latter.

The *silent gap* in auscultatory estimations of blood-pressure is discussed by P. C. Gibson (Lancet, Nov. 12, 1927). It was 1st observed by Tixier in 1918, certain cases being found to exhibit a zone of silence extending over 20 to 30 mm. Hg, preceded and followed by zones of clear arterial sounds. With reference to the ordinary sequence of 4 zones elicited in the auscultatory determination of blood-pressure, the silent gap is found in the 2d zone—the one described as “variable in extent and in the quality of the sounds, which are like murmurs.” The gap, which may extend over a range of 20 to as much as 60 mm., more or less replaces the 2d zone, sometimes appearing near the upper extremity and at others near the lower. An important characteristic is that when the sounds have ceased to be audible, the movements of the arterial wall below the armlet, as measured by an oscillometer, show no abatement, and, moreover, the pulse wave may easily be felt at the wrist. In 4 cases in which the silent gap was noted by the writer, the only pathologic factor common to all was a blood-pressure of 200 mm. or over.

Arterial hardening and myocardial failure did not prove admissible as the cause of the phenomenon. The gap is sometimes a variable condition, being present on 1 day and absent on another. It is undoubtedly a serious source of error in sphygmomanometry, and sometimes accounts for great discrepancies in readings taken on the same patient by different observers and even by the same observer at different times. An error of 20 per cent. may in this way creep into our readings unawares. A standardized technic for taking blood-pressure is advised by the writer for minimizing inaccuracy. The armlet pressure should, to begin with, always be raised well above 200 mm. The systolic pressure is read when the 1st sound in the vessel is heard, and the diastolic when the loud sounds suddenly become soft. The procedure should be repeated once or twice until consistent readings are obtained. The systolic readings should be controlled by palpation of the radial artery. Usually the 1st sound appears to the ear at a level a few millimeters higher than that at which the radial pulsations become palpable.

**HYPERTENSION. — ETIOLOGY AND PATHOGENESIS.**—An investigation of the relation of hypertension to constipation by W. C. Alvarez, R. L. McCalla and A. Zimmerman (Arch. of Int. Med., Aug., 1926) led to the conclusion that in men constipation has absolutely no effect on the blood-pressure. In women, a rather definite connection was found between constipation and a slightly *lower* mean blood-pressure. Of this there are 3 possible interpretations: The constipation may lower the pressure;

lower pressures may cause the constipation, or higher pressure may be slightly laxative. Men with normal weight were found to average 10 mm. higher in pressure than the lean, while the stout averaged 13 mm. higher than those with normal weight.

According to R. E. Thomas (Cal. and West. Med., July, 1926), *heredity* is undoubtedly the greatest single factor in the etiology of hypertension. Aside from certain physical characteristics—sthenic habitus—observed in the families prone to hypertension, there is a more or less characteristic mental make-up or disposition; the individuals are intense in everything they do, worry without showing it, and cannot relax. As to the relation of hypertension to *chronic nephritis*, the latter may be divided into 2 types—with and without edema. In the former, hypertension often occurs but is often absent; the glomeruli are chiefly affected and the disease is usually traceable to infection. In the 2d type, hypertension is constant, the renal lesions are chiefly vascular and proliferative, and no constant etiologic factor is demonstrable unless it be a preëxisting hypertension.

J. Ferber (Med. Jour. and Rec., Dec. 15, 1926) notes that the mechanical theories of hypertension are now discarded. Of the chemical theories, that which ascribes it to an altered composition of the blood is most popular, but the exact responsible factor is unknown. The ordinary metabolites cannot be blamed. Other theories hold responsible increased suprarenal activity, cholesterinemia, an excess of dimethylguanidine sulphate in the blood, or some pressor substance retained in the blood and causing vasoconstriction.

The writer believes that other factors besides vasoconstriction and increased peripheral resistance are effective in causing hypertension. Heredity seems to play a very important part. On inspection he distinguishes 2 types of patients—those of the red hypertension type, with a plethoric, robust appearance, and those of the pale hypertension type, the difference depending on whether there exists a spasm of the internal arterioles and not of the skin capillaries (red type) or whether the entire system of capillaries is contracted (pale type).

*Sexually abnormal women*, according to Alvarez and Zimmerman (Arch. of Int. Med., May, 1926), have pressures averaging considerably higher than the sexually normal. A masculine distribution of body hair, sexual anesthesia, uterine fibroids, thyroid disease, and pelvic conditions requiring ovariectomy or hysterectomy are associated with high average pressures. Abnormal menstruations, early menopause and pregnancy, however, have no demonstrable effect. Marked hypertension was found in a few girls who seemed normal sexually, but in these severe nephritis was present. As the sexually abnormal tend to get married a little later than the normal, single women have pressures averaging a little higher than those of married women. The evidence suggests to the writers that "essential" hypertension is a bodily peculiarity, inherited equally by girls and boys, but ordinarily repressed in women before the menopause by the ovarian or other related secretions. When the pelvic organs are subnormal, the disease may appear in women as early as it does in men. The average systolic and diastolic pressures in women who

seemed sexually normal were found by the writers to be, approximately, 122.1/82 in the twenties, 125.8/83.5 in the thirties, 135.3/88.4 in the forties, and 154.4/93.8 after fifty.

The common association of hypertension with *mitral stenosis* and *aortic insufficiency* has drawn the attention of E. P. Boas and M. H. Fineberg (Amer. Jour. Med. Sci., Nov., 1926). Over  $\frac{1}{2}$  of patients past 40 years of age with mitral stenosis had a systolic pressure over 150 mm. and diastolic over 90. Hypertension was much more common in women than in men. The close parallelism of age and sex distribution in mitral stenosis and essential hypertension suggested a more than accidental relationship of these 2 conditions, and this was borne out by certain further statistical studies. A plausible explanation is that since, in mitral stenosis, the minute volume of cardiac output may be considerably reduced, the vasomotor center is stimulated in order to maintain a sufficient blood-supply for the brain. The granular kidneys often found at autopsy in mitral stenosis are believed the result of arteriolar disease and to indicate a long-standing hypertension and valvular disease. In uncomplicated aortic insufficiency, hypertension was much more common in the arteriosclerotic than in the rheumatic and syphilitic groups. In the arteriosclerotics, the hypertension is, perhaps, primary and the aortic insufficiency may have resulted from the excessive strain placed on arteriosclerotic valve leaflets.

In experiments with isolated arterial strips, K. K. Koessler, J. H. Lewis and J. A. Walker (Arch. of Int. Med., Feb., 1927) found that cer-



tain strains of many common micro-organisms—pneumococci, streptococci, and members of the colon-typhoid group—formed substances which caused definite arterial constriction and bronchial spasm. The action of these poisons is frequently selective: A filtrate causing bronchiolar constriction frequently had no action on the arteries, and *vice versa*. The chemical nature of these substances is still unknown; only a small percentage can be identified as histamine or tyrosine. Almost all strains of organisms of the typhoid group yielded a filtrate causing intense arterial constriction *in vitro*. Streptococci furnished the largest number of strains forming vasoconstrictor substances. These results support the view that *bacterial toxins* formed in infected foci, the gastrointestinal tract or elsewhere, may induce hypertension through the production of vascular spasm.

*Hypertension of the pulmonary circulation* has been carefully studied by E. Moschcowitz (Amer. Jour. Med. Sci., Sept., 1927). The condition is common, but passes generally under the names pulmonary congestion, right-sided insufficiency, or arteriosclerosis of the pulmonary vessels. It is caused by any lesion that increases the peripheral resistance within the lesser circulation. The commonest causes are mitral disease, especially mitral stenosis; emphysema, whether primary (senile) or secondary (asthmatic); infiltrating lung lesions (chronic tuberculosis with induration, bilateral pleural synechiæ, chronic interstitial pneumonia, tumors); kyphoscoliosis; patent ductus arteriosus, and communications between the 2 sides of the heart. Sustained hypertension of the lesser

circulation leads to arteriosclerosis of the pulmonary vessels. Primary arteriosclerosis of these vessels is extremely rare or non-existent. The physical signs of hypertension in the lesser circulation are those brought about by the compensatory mechanism and are, in the main: Increased venous pressure, accentuated 2d pulmonary sound, dilatation and hypertrophy of the right heart, dilatation of the pulmonary conus, cyanosis, dilatation of the superficial veins (especially pectoral), enlarged and tender liver, lowered kidney function, and infarction of the lungs.

A transient—usually terminal—hypertension of the lesser circulation arises under a number of other conditions. In general vascular hypertension, it may follow mitralization, when myocardial insufficiency sets in and when there is an associated emphysema. This explains in part the difference between the pale and the cyanotic hypertensive. In left coronary disease hypertension of the lesser circulation arises only after myocardial insufficiency sets in. The so-called Ayerza's disease is a syndrome developing from any lesion that causes hypertension and consequent arteriosclerosis of the lesser circulation. Edema of the lungs may either follow or cause hypertension of the lesser circulation. It is likely that hepatic cirrhosis associated with cardiac disease is the result of the increased venous tension within the hepatic area and of an hepatic arteriocalillary fibrosis.

**PROGNOSIS.**—With the onset of hypertension the patient's period of health and well-being is not necessarily ended, according to T. P. Sprunt (South. Med. Jour., June,

1926). In 15 of his cases there was either a complete lack of progression of the hypertension or else marked improvement in the blood-pressure after 5 to 7 years. Patients with no sign of arterial change may be expected to do well. Those with normal urine and those with normal aortas in general show a rather favorable prognosis. Patients with marked retinal changes, any sign of myocardial insufficiency, precordial pain, or renal insufficiency may be expected to live only a very few years. Hypertension in the very young is rather graver than in the very old. The onset of hypertension during the menopause in women presents the most favorable prognosis of all. J. H. Gibbes (*ibid.*) states that a diastolic pressure above 100 gives a bad outlook. A phthalein output below 40 per cent. is unfavorable. Patients with enlarged hearts do not improve readily. Adiposity increases the gravity of hypertension.

The prognosis in *essential hypertension* is discussed by J. E. Paullin (Jour. Amer. Med. Assoc., Sept. 18, 1926). Among 76 cases under observation from 5 to 17 years, the sexes were equally represented. The mortality in the males, however, was 48.7 per cent., as against 9.2 per cent. in the females. Myocardial failure occurred earlier than cerebral hemorrhage among the men. It occurred much earlier in men than in women. Death from cerebral hemorrhage in a majority of the cases was preceded by a previous apoplectic seizure. Renal involvement in the late stages of essential hypertension is usually very slight, only 1 death occurring in the series because of renal failure. No definite prognosis can be given from

study of the blood-pressure alone, the prognosis depending on the integrity of the circulatory system.

*Malignant hypertension* is recognized as a definite clinical syndrome by N. H. Keith (Amer. Heart Jour., Aug., 1927). Of his 81 cases, 73 died within 51 months. The majority of cases occur between the ages of 35 and 50 years. Diffuse disease of the arterioles was found in the pathologic material examined. During the disease, particularly in the terminal stage, diffuse involvement of the vital organs may be demonstrated, especially of the cerebrum, myocardium and kidneys. Many cases seem to die from simultaneous failure of these organs. The primary cause of the hypertension seems to be interference with the vasomotor system, possibly due to toxic substances or to disturbance of the sympathetic system.

Retinitis and a frequent adequacy of the renal function are 2 important diagnostic features of malignant hypertension. The type of the retinitis, not its severity, is characteristic. Edema of the discs is a striking condition in all cases. The retinitis, mild or severe, runs a characteristic course divisible into 4 stages: (1) Hyperemia and mild edema of the disc and peripapillary portion of the retina, with a few superficial hemorrhagic areas and cotton-wool exudates. (2) Edema more marked and spreading into the macular region and periphery. Areas of hemorrhage and exudate more numerous and found farther away from the disc and in the deeper retinal layers. (3) Edema begins to recede from the periphery and small pigment spots are seen instead. Punctate exudates begin to outnumber the cotton-wool

exudates. Hemorrhagic areas fewer and more peripheral. Hyperemia of discs fading. Sclerosis of retinal arterioles gradually becoming more marked. (4) Disc pale, only blurring and increased connective tissue remaining as evidence of the previous edema. Few punctate exudates remain. Definite perivascular thickening along arteries and veins. Areas of proliferated pigment numerous.

Among 218 cases of *hyperpiesia* (primary hypertension) coming to necropsy, E. T. Bell (Minn. Med., Jan., 1926) found: (1) Cases with cardiac symptoms, 155. Of these, 98 died from myocardial exhaustion, 35 from coronary sclerosis, 7 from renal insufficiency, 7 from intercurrent diseases, and 2 by accident. (2) Cases without prominent cardiac symptoms, 63. Of these, 32 died from brain lesions, 10 from intercurrent diseases, 10 by accident, 9 from renal insufficiency, and 2 from undetermined causes.

**TREATMENT.**—Treatment is begun by J. S. McLester (Amer. Jour. Med. Sci., Nov., 1926) with **rest in bed** for 3 or 4 weeks and absolute mental and physical rest. Thereafter the patient's life should be regulated. Unless renal impairment is evident, the **diet** need not be restricted enough materially to lower the nutritive efficiency. No special selection of the protein foods is necessary. With good renal function, as shown by an approximately normal urine, normal blood chemistry, little or no increase in night urine, and no fixation of specific gravity, an average man should be allowed about 75 Gm. of protein daily, often a little more; with renal impairment, 50 or 60 Gm. With signs of impending disaster, as a 25 per cent. or less phenolsulphonphthalein output, blood urea of 50 mgm. or more, and blood creatinin

approaching 5 mgm., only 30 or 40 Gm. of protein are allowed. The writer finds no special virtue in the salt-free or **salt-poor diet**. It is enough to instruct the patient not to eat unusually salty food and to restrict the use of salt as much as possible. Many cases show marked improvement on weight reduction by a **subcaloric diet**, *e.g.*, 15 to 20 per cent. below the normal. **Thyroid**, given cautiously, is sometimes of value. **Removal of all foci of infection** is important. Impending uremia can often be aborted by **venesection**—not less than 600 c.c., often more. **Chloral hydrate** in small doses relieves restlessness and insomnia. Injection of **liver extract** at times produces a drop in the systolic and diastolic pressures, lasting for a few hours to several days. It may ameliorate refractory headache.

Sir Humphry Rolleston (Lancet, Jan. 1, 1927) states that in established hypertension all excess of food should be avoided rather than any special quality. The proteins should, however, be reduced, red meat being prescribed. Clear soups, meat extracts, sweetbread, strong tea and coffee are best omitted. An exclusive **milk diet** is useful for a few days, but semi-starvation must be avoided. Tobacco should not be used, particularly in the presence of ill-effects, as cardiac pain and irregularity. Rest in bed for a whole night or occasionally for a whole day is indicated. Moderate **exercise** in the open air is advisable. Treatment at **spas** is sometimes very useful. **Diathermy**, **ultra-violet ray** treatment, **lumbar puncture** and **venesection** are all helpful in reducing the pressure. Of drugs **bromides** are, on the whole, most effective. The

effects of **nitrites** are fugitive only, but they relieve headaches and insomnia. **Calomel** is beneficial. Constipation should be prevented. **Ovarian extract**, or **corpus luteum**, has been used in menopausal cases.

Primary or essential hypertension is divided by S. F. Adams and G. E. Brown (Ann. of Clin. Med., May, 1927) into (a) mild benign, with diastolic pressure below 115 mm.; (b) severe benign, with diastolic pressure usually above 115 mm.; (c) malignant, and (d) questionable or premalignant. To determine the value of various therapeutic measures, 200 cases were observed. The **diet** consisted of 1500 calories, 176 of which were protein. Usually no extra salt was allowed and the fluids were limited to 1500 c.c. The patients were kept in bed for the 1st 3 days of the hospital course. The effect of **rest** was most pronounced in the mild benign cases, the systolic and diastolic pressures dropping more than 17 per cent. after the 3 days' rest. Mild benign cases also showed a more pronounced effect from **sodium nitrite** than the other cases. Following a **hot bath** of 15 minutes at 105° F. (40.55° C.) the severe benign type showed the most striking depression. Giving **phenobarbital** apparently caused a lowering of diastolic pressure in the benign types; its effect on systolic pressure was not pronounced. While **reduction of weight** caused no striking change in blood-pressure, the writers recommend a regimen that will cause slow reduction in weight if patients are more than 10 per cent. overweight. Foci of infection should be given every possible attention. From **sodium sulphocyanate** no remarkable effects

were seen in benign hypertension and none in the malignant form. **Liver extract** was not especially valuable. Diathermy proved worthless.

**Rest** is particularly essential if there is any evidence of pulmonary congestion or cyanosis, according to G. G. Duncan and A. Rudy (Amer. Jour. Med. Sci., Sept., 1926). Combined with this they believe a strictly **salt-free diet** has in their hands proved more effective than any drugs in reduction of hypertension and restoration of the myocardial reserve. The diet should be such that the total chlorides in the urine when calculated as NaCl shall not exceed 0.5 Gm. a day. This calls for exclusion of all foods high in salt, such as bacon, ham, smoked or preserved meats, bakers' bread, canned fruits, vegetables and soups, as well as milk. Fruit in the form of apples, oranges and grapefruit, and cereals, as oatmeal, farina and shredded wheat are allowable. Eggs and salt-free bread with sweet butter are also permitted. Reduction of blood-pressure in every instance resulted from this treatment. The systolic pressure was lowered to a satisfactory level in 7 of the 10 cases studied, the diastolic in 6. **Digitalis**, **caffeine diuretics** and **novasurol** were given in some cases. Loss of weight was prominent in the course of treatment, and is ascribed to water-loss resulting from the salt restriction, the caloric intake having been established at a maintenance level.

By **weight reduction** R. H. Rose (Med. Jour. and Rec., Dec. 1, 1926) obtained an average reduction of blood-pressure of about  $\frac{1}{2}$  the increase above normal. The measures employed consisted of **diet**, **organ ex-**



tracts, and cathartics, as well as attention to focal infections. In 35 cases the average reduction of weight was 16 pounds; of systolic pressure, 39 mm., of diastolic pressure, 20 mm., and of pulse pressure, 17 mm. The effects were best in cases of recent development. Dyspnea, palpitation, pulsation in the ears, and headache were relieved and beginning cardiac decompensation was benefited. Reduction of high blood-pressure attending Bright's disease is not claimed for the treatment, although in some cases albuminuria due to renal congestion disappeared under it.

A. R. Elliott (Amer. Jour. Med. Sci., Aug., 1927) warns that, except under special circumstances or to meet some definite indication, such as obesity, the practice of dietary depletion should not be enforced without a careful checking of its effect from time to time. Benedict suggests regulating the degree and duration of the privation diet according to the hemoglobin index, which should not be allowed to fall below 80 per cent. In the plethoric with threatened heart-failure—"high blood-pressure stasis"—a good **bleeding** will sometimes postpone the breakdown. In apoplexy prodromes, it may tide over the crisis. The reduction of pressure, especially diastolic, from free venesection may last several days. A regular half-hour **rest** or **nap after meals** may be of great benefit, the pressure later remaining low for a considerable period. As the case advances, with the advent of dyspnea after meals or usual activity, **every other week-end in bed** is excellent for patients in active business, and 1 of the very best measures is a **week or 2 in bed** with business excluded 4

times a year as a routine. Circulatory reserve is thereby improved. When there is actual cardiac insufficiency, **recumbency** should be enforced; resumption of activity should be gradual. For dropsy, **theobromine**, **theocin** or **theophylline** may prove effective; if not, **euphyllin** may be tried, and next in order, **salyrgin** or **novasurol**. With the latter the writer has often been pleased; it may prove more effective intravenously than intramuscularly. With **ammonium chloride** or **calcium chloride** it may act more vigorously than when given alone, and association of **digitalis** is helpful to its action. As a last resource **digitalis** should be patiently tried, in optimal dosage; thorough digitalization is ordinarily not indicated. For urgent stimulation a few doses of a sterile solution may be given intravenously.

Pressor bases were found by W. Bain (Lancet, Feb. 25, 1928) in normal urine. They are absent from the urine, however, in most cases of high blood-pressure, or greatly reduced in amount. The amount of isoamylamine being much larger than that of any other pressor base in normal urine, the writer believes its retention in the body to play the chief rôle in hyperpiesis. Since isoamylamine is derived from putrefactive nitrogenous material, beef, mutton, veal and lamb should be omitted from the diet in hyperpiesis. Eggs, fish and fowl may be allowed. The diet should be considerably restricted in those leading sedentary lives. In making out a diet list it is well to ascertain the idiosyncrasies of the patient, as flatulent dyspepsia tends to increase the blood-pressure. Stimulation of the liver by **liver packs** or

chologogues lowers the blood-pressure in cases of cholecystitis. **Massage under warm water**, avoiding the abdomen, has a distinct effect in reducing blood-pressure. In some cases **Nauheim baths** have a slight reducing effect. A moderate amount of **exercise** such as golf (9 holes) or walking is beneficial. After exercise a **warm bath** is desirable—not over 2 minutes at 94-98° F., with prompt, thorough drying with a warm bath-sheet. The writer usually advises patients with diastolic pressure 120 mm. or over to stay in **bed 1 day a week**. Where the systolic pressure exceeds 200 mm. it is as a rule advisable to give **erythrol tetranitrate** for several days before beginning hydrotherapy. In 2 cases in which **animasa** tablets were used, with waters and baths omitted, a moderate reduction in pressure followed.

As regards **liver extract**, reports have been discordant and results dubious. Among the more favorable reports is that of W. J. MacDonald (Wis. Med. Jour., Jan., 1927). This writer notes that the hypotensor action of most extracts of organs or tissues has been shown due to the presence of histamine in them. He observed the effect of liver and tissue extracts upon 33 cases of essential hypertension. Upon intravenous, intramuscular or subcutaneous injection the effect was markedly similar to that of histamine, but much more prolonged, indicating that the extracts contain some other depressor substances aside from the histamine. In a group of cases treated the average pressures at start of treatment averaged  $19\frac{4}{110}$ ; after 15 days' treatment,  $14\frac{2}{86}$ . The pressure nearly always gradually returns to the orig-

inal level after cessation of treatment, but when the latter is repeated the pressure falls more rapidly and stays low longer. Upon repeated treatments the pressure will often remain low for several months. M. F. Lautman (Med. Jour. and Rec., June 16, 1926) reported good results from a depressor principle obtained by subjecting a mash of fresh calves' liver to prolonged extraction with 80 per cent. alcohol, and when the concentration reached 90 to 95 per cent. dissolving the precipitate formed in distilled water. The unit of dosage was the amount of extract neutralizing 1 c.c. of 1:1000 adrenalin solution.

The **high frequency current** is praised by H. R. Nelson (Can. Med. Assoc. Jour., June 5, 1926). A preliminary dose of castor oil is given. Some patients respond to the 1st high frequency treatment. A reduction of more than 10 or 15 mm. Hg is not attempted at any 1 sitting. Six or 8 treatments may be required to obtain an appreciable lowering of pressure, but once it sets in it usually progresses with each treatment. When the normal for the patient is reached and maintained steadily for 4 or 5 treatments, the patient is discharged but asked to return in 6 weeks or earlier if the symptoms suggest a rise. If the pressure has risen, a few treatments usually bring it down again, but the case should be observed for 6 months to 1 year. Of some 30 cases treated, in only 2 could the pressure not be brought down by high frequency.

The favorable effects of **carbonated water baths** in hypertension unassociated with arteriosclerosis are dealt with by F. Lange and A. Störmer (Zeit. f. Kreisl., Dec. 1, 1927). The water of the baths is saturated with

carbon dioxide. Water below a temperature of 33° C. (91.4° F.) must never be used. At first, 3- to 5-minute baths in water at 35 or 34° C. (95 or 93.2° F.) are given. The carbon dioxide produces a sensation of warmth in the skin, and in all cases treated there was a reduction of 20 to 50 mm. Hg during the bath. In many instances a series of baths caused a lasting decrease of pressure. The pulse becomes slower during the bath. Headache and restlessness are regularly allayed. A rise in pressure during the bath indicates either too long a bath or too low a temperature.

I. S. Barksdale (Amer. Jour. Med. Sci., Jan., 1926) obtained from water-melon seeds a substance belonging to the glucoside-saponin group which he terms **cucurbocitrin** and which, according to the effects seen on the blood-pressure in dogs, on the capillaries of both frog and man, and on clinical cases, lowers the blood-pressure by capillary dilatation. Lethal doses in rabbits also caused marked dilatation of the blood-vessels of the bladder wall, with marked flow of mucus. Ingestion of 20 mgm. ( $\frac{1}{3}$  grain) of the principle by a normal subject lowered the systolic pressure in 1 hour from 119 to 105. In 10 cases of hypertension due to tuberculous nephritis the pressure was usually lowered by about 20 to 40 mm. In 1 instance the dosage is mentioned as having been 10 mgm. ( $\frac{1}{6}$  grain) daily. Both systolic, diastolic and pulse pressures were lowered. In 4 cases of *acute cystitis* also treated with the drug—dosage in 1 instance mentioned as 20 mgm. ( $\frac{1}{3}$  grain) daily in 2 doses—clinical relief was very prompt.

According to K. Westphal (Münch. med. Woch., July 16, 1926), the **salts of sulphocyanic acid** act well in hypertension. They enhance the dispersion of colloidal systems, and may counteract the decreased permeability of the surface of smooth muscles of arteries, where this exists in hypertension. The dosage is 0.1 Gm. ( $1\frac{1}{2}$  grains) 3 times daily for the 1st week, twice daily in the 2d week, once daily in the 3d, and intermission in the 4th.

**Bismuth subnitrate** has been used in 140 cases of hypertension by E. J. Stieglitz (Jour. of Pharm. and Exp. Ther., Nov., 1927), in doses of 5 to 9 grains (0.32 to 0.6 Gm.) 3 or 4 times a day. After or during the search for and removal of definite sources of intoxication and vascular injury, the drug proved a valuable auxiliary. Prophylactically, it is valuable against the hypertension of *pregnancy*, other than in acute eclampsia.

In 4 cases of hypertension treated by Mattei and Dias-Caravoni (Bull. Soc. méd. des hôp. de Paris, May 21, 1926) with **chloral hydrate**, the pressure was lowered in 3 or 4 days by 20 to 60 mm. The dosage was 0.5 Gm. ( $7\frac{1}{2}$  grains) twice daily or 0.25 Gm. ( $3\frac{3}{4}$  grains) 4 times daily by mouth. The effect continued for 3 to 6 days after the treatment, and was accompanied by diuresis.

**HYPOTENSION.**—A. Friedlander (Medicine, May, 1927) notes that focal infections arising from chronic inflammation of the tonsils, teeth, accessory nasal sinuses, gall-bladder, genitalia, etc., are very often accompanied by marked hypotension. Such hypotension is usually due to marked depression of vasomotor tone, though myocardial changes may account for some cases. Some authors recognize

a syndrome of "essential hypotension." The subjects complain of headache, vertigo and palpitation after moderate exertion. The condition occurs most commonly between the ages of 20 and 40 years, and is much more frequent in females than in males. Physical examination shows no organic lesion. The condition is ascribed by the writer to a loss of tone in the smaller vessels, particularly the capillaries, caused by the abnormal presence of histamine or similar bodies.

**TREATMENT.**—According to A. E. Fossier (Amer. Jour. Med. Sci., Apr., 1926), the various customary hypotheses as to the causation of hypotension are untenable, and the characteristic symptomatology of it is that of asthenia or splanchnoptosis. It occurs in patients with an elongated ascending aorta, a narrowing of its hemicircle, and a drop heart. The longer the pipe and the smaller the radius of the bend, the less the final velocity energy. The low blood-pressure in these patients is raised by **abdominal support, strengthening of the abdominal muscles, and increase of the abdominal fat.**

W. M. Johnson (South. Med. and Surg., Jan., 1927) states that hypotension is probably caused by the increased demand on the adrenal glands attending special effort, which is quickly followed by a temporary decrease in their secretion. In influenza hypotension is an almost constant finding. In the treatment of the hypotension of acute infections, **rest** is essential. Every patient with fever should stay in bed 1 to 3 days after the temperature is normal, then take an equal time to convalesce before going to work. A nutritious, easily

digested diet is important. **Coffee** and **tea** may be allowed freely unless there is insomnia. Adrenalin would seem indicated, but its action is too fleeting to be of much value. The writer prescribes the following in hypotension:

R *Tr. digitalis*,  
*Tr. nucis vomicae* ..āā f3vj (24 c.c.);  
*Tr. gentian. comp.*...ad f3iij (90 c.c.).

M. Sig.: One teaspoonful in water 3 times daily before meals.

According to A. Graham-Stewart (Practitioner, Feb., 1928), the treatment in low blood-pressure should be directed against a toxemia causing it. The diet should include dairy produce, fresh fruits in abundance, salads and vegetables, and a genuine wholemeal bread, with abstinence from all kinds of flesh, as they tend to promote putrefaction in the colon. Foods richest in the various **vitamines** should be insisted on, but with omission of flesh. In marked cases **colon lavage, abdominal massage, exercises** and a **Curtis belt** should be prescribed. Of drugs, the writer uses liquid petrolatum in generous doses, and enough **belladonna** to produce mild physiologic effects—about 8 minims (0.5 c.c.) of the tincture twice daily. A **vaccine** prepared from the feces may be of great help, especially when the culture is chiefly streptococcal. Regular **exercise** should be enjoined, with all the **sunlight** possible, and every general law of hygiene complied with. When the toxemia has been cleared up, say in 3 months, **pituitrin** is useful. **Strychnine** is a generally useful drug. Under the above treatment the pressure will usually rise to a more **normal level**—frequently by 20 to 30 mm. Hg. Even if it does not actually reach



normal, the patient's sense of well-being and the disappearance of lassitude will repay the time and trouble.

*Postural hypotension with syncope* is recognized by D. G. Ghrist and G. E. Brown (Amer. Jour. Med. Sci., Mar., 1928) as a clinical syndrome. Bradbury and Eggleston had already reported 3 cases featured by: (1) Syncope attacks on change of posture with drop of systolic pressure to the shock level; (2) slow and unchanging pulse-rate with marked variation in the blood-pressure; (3) anhidrosis; (4) increased distress in the summer heat; (5) slight decrease in basal metabolic rate; (6) signs of slight and indefinite changes in the nervous system; (7) blood urea at upper normal level. The vertigo and syncope must be distinguished from those of toxic vertigo, exhaustion states, the Stokes-Adams syndrome, intracranial lesions, epilepsy, and vestibular disease. The writers report 2 cases. In Case II the blood-pressure changed from  $54/40$  to  $142/94$  during progressive inclination of an adjustable table supporting the patient. In this case, **ephedrine** gave gratifying effects in blood-pressure tests and the patient was instructed to take 25 mgm. ( $5/13$  grain) of it by mouth each hour during the period which would best fit his occupational needs. Two months later he reported having taken the drug 5 times a day and being able to walk any distance and climb stairs. Later he improved further and was distressed only on hot days. A change of dosage to 2 or 3 capsules of 50 mgm. ( $10/13$  grain) each day seemed sufficient to maintain his efficiency in the upright position. S. T. Wu and B. E. Read (China Med. Jour., Dec., 1927) reported favorable

effects from **ephedrine** in hypotension. It was given by mouth in average doses of 0.06 to 0.08 Gm. ( $12/13$  to  $16/13$  grain).

**BONES.—CYSTS.**—The *solitary bone cyst*, according to D. B. Phemister and J. E. Gordon (Jour. Amer. Med. Assoc., Oct. 30, 1926), is essentially a disease of the growing period. It has been variously considered a degenerated tumor, a localized malacia or dystrophy, the result of a hematoma of the marrow, and an infection. The common belief appears to be that it is not an infection. It is less common in the very young than osteomyelitis. The clinical picture, however, is not incompatible with subacute or chronic infection by organisms of low virulence. Rheumatic pains, slight swelling and tenderness are frequent. Fever has rarely been reported. The absence or mildness of local or general symptoms does not exclude infection, since proved cases of localized staphylococcal osteomyelitis occasionally produce slight or no symptoms. Pathologic fracture is common and is often the 1st symptom. Neither fracture nor operation sets up an acute inflammatory reaction at the seat of the cyst. There is no appreciable new bone formation from the overlying periosteum. The disease is self-limited, and usually heals either as a result of 1 or more fractures or spontaneously after a protracted course.

**GRAFTS.**—A. Fowler (Brit. Jour. of Surg., Apr., 1927) reports a case of tumor of the *5th metacarpal*, which was excised completely because of a suspicion of sarcoma. A *tibial graft* rounded at the distal end was fitted snugly into the denuded carpus at

the proximal end and fixed by muscle suture. Active and passive movements were begun early. The distal end of the graft became eburnated and formed a head which fitted into the base of the proximal phalanx. The end-result was full extension,  $\frac{3}{4}$  normal flexion, and full abduction. The little finger was somewhat shorter than normal. The tumor proved to be an osteochondroma.

**PAIN.**—A form of *menopausal bone pain* simulating chronic arthritis and following the natural or artificial menopause is described by J. Dalsace and C. O. Guillaumin (Gyn. et obst., Jan., 1927). Muscular weakness often coexists. The pains are worse at night, especially on motion. The blood shows diminution of calcium and phosphorus. While the pains tend to pass off spontaneously in 8 to 16 months, active treatment is advisable, as they may represent the beginning of arthritis deformans. A solution containing  $2\frac{1}{2}$  drams (10 Gm.) of phosphoric acid in  $3\frac{1}{3}$  ounces (100 c.c.) of water is ordered—2 teaspoonfuls daily. **Codliver oil** combined with **phosphorus** and **adrenalin** may also be useful in combating the mineral deficiency. The **ultraviolet rays** markedly enhance the therapeutic results. Ovarian extract alone fails.

**TUBERCULOSIS.**—**Intramuscular injections** of sterile peanut oil to which a small amount of **tincture of iodine** has been added are advocated in surgical tuberculosis by A. Finikoff (Rev. de chir., lxxv, 355, 1927). From 80 to 160 minims (5 to 10 c.c.) of this iodized oil are injected every 5 to 8 hours. The monocytogenic action of the absorbable oil increases the lipase of the blood, thus helping to digest the fatty covering of the tubercle

bacilli. Simultaneously, the proteolytic and leukocytogenic effects of the iodine tend to break up the proteins of the bacilli. Large amounts of **calcium salts** are also given orally or intravenously, counteracting demineralization and helping to neutralize the fatty acids set free through the destruction of the fatty covering of the bacilli. Of 48 cases treated by this method, 34 were cured, 10 improved and 3 not improved. The clinical cure is effected in 6 to 8 months.

Stimulation of the lymphocytes, regarded as the main defensive factor in surgical tuberculosis, is the object aimed at by Meszaros (Arch. f. klin. Chir., May 22, 1926). **Iodine** given in any form and by any route has this effect, but the best results are obtained by painting large areas of skin with it and by giving intramuscular injections of **iodine and iodoform in glycerin**. The iodine must be carefully adjusted to the reactive power of the patient. **Heliotherapy** and **high altitude** climates are other means of stimulating the lymphocytes.

According to Kisch (Strahlenther., xxviii, 227, 1928), **heliotherapy** acts chiefly by inducing hyperemia. The advantages of the high Alps over the lowlands in heliotherapy have been much exaggerated, and the writer's results in 10 years near Berlin were practically the same as those reported from institutions in the Alps. Uninterrupted sun treatment is not necessary or even desirable, and the lack of a continuous succession of sunny days is not a disadvantage in the treatment.

Sir Henry Gauvain (Lancet, Apr. 9, 1927) lays stress on careful adjustment of dosage in **light treatment** to

the estimated power of response by the individual patient as judged by clinical experience. There is great diversity of response, whether sun or artificial light is being used. There is both a seasonal and a daily variation in response. The greatest seasonal response is in the spring and early summer. With patients responding well up to July, but then commencing to flag, acceleration is again obtainable by transferring the cases to a **seashore** institution; the different intensity of the light will not alone explain this change, but the combination of altered stimuli will. Continuous exposure to sunlight in summer will not produce benefit as speedily as alternations of light and shade, heat and cold, humid and dry air. From prolonged intense stimulation by excess of sunlight the patient becomes exhausted, irritable and nervous. The Alpine climate especially helps the case with much recuperative power capable of responding to intense stimulation. Many patients are sent to the Alps, however, who would do much better at home. This applies to the cachectic, non-pigmenting patient, of low resistance, and for young children or elderly people, who rapidly become exhausted under excessive stimulation. For the winter season the writer uses balconies with partially sliding roofs of vitaglass. In fine weather the distal sliding panels are raised and direct insolation proceeds. Special arrangements are made for perfect ventilation even during driving rain. On another balcony, in a specially sunny situation, the fixed portion of the roof is constructed of calorex, a glass which absorbs the greater part of the heat. Here the

patient may be in bright direct sun or pleasant cool shade at will. **Artificial light** is installed to supplement natural light when the latter is deficient. A constant rise in basal metabolism occurs after a course of sun treatment, but this is due to exposure of the nude skin to cold air, not to the sunlight. In those incapable of vigorous response, a reaction, if desired, is better obtained by progressively increasing shock stimuli than by continuous exposure, and these stimuli are best secured by graduated paddling, spraying or immersion in sea water. For the very young or old, the very weak or toxic and cachectic, even this is excessive, and the more gentle stimulus obtained inland can alone be availed of. Reyn, after artificial light treatment at the Finsen Institute, administers a **cold** or **tepid douche** after the general light bath, and the writer does likewise.

Skin pigmentation following sun treatment is valuable because it has a protective function; longer exposure to light and cold can be tolerated. Pigmentation is not necessarily synchronous with amelioration of disease, though frequently it is so. In good pigmenters who do not respond successfully to insolation, light treatment should probably be more intermittent and the effect of increasing shock exposures ascertained. Quite likely, much stronger or weaker stimuli than have been given are needed.

N. Allison (Surg., Gyn. and Obst., June, 1927), discussing **heliotherapy** in surgical tuberculosis, states that at the New England Peabody Home for Crippled Children in Newton Center, Mass., it has been found that in *cervicodorsal spinal* tuberculosis there is no improvement, while in

*upper dorsal* tuberculosis, improvement results in 30 per cent.; in *middorsal*, 50 per cent., in *low dorsal* and *dorso-lumbar*, 66 per cent., and in *lumbar*, 90 per cent. Practically complete correction of the deformity is possible only when 2 adjacent vertebral bodies are diseased. *Hips* and *knees* have healed to the point of weight-bearing without reactivation of symptoms. In *tarsal* involvement marked improvement has resulted. *Spina ventosa* finally heals with little disturbance of function or deformity. Heliotherapy should be supplemented by **rest, good food, fresh air, surgical protection of the diseased areas, and pleasant surroundings.** Often the writer has employed **blood transfusion** with benefit. While, according to impressions gained at the Rollier clinic, surgical interference is there considered the great catastrophe of surgical tuberculosis, the writer believes that **operations** designed to assist the body in healing are of value, and often result in apparent cure and lessening of the period of invalidism.

According to Vanderlinden (Bull. méd., Oct., 15, 1927), 95 per cent. of cures in surgical tuberculosis are obtainable by **vaccine** therapy. He describes 12 cases in which Vaudremer's vaccine was employed.

**TUMORS.—DIAGNOSIS.**—Discussing the *central lesions* of bone, including tumors, J. C. Bloodgood (Jour. of Bone and Joint Surg., Apr., 1927) states that the predominant central lesions are *osteitis fibrosa* and the *giant-cell tumor*. Next comes the *metastatic tumor*. *Chondroma*, *myxoma*, and *sarcoma* developing in 1 or the other are not common tumors. The *multiple myeloma* without evidence of other bone involvement is rare. When the

X-ray shows a definite bone shell, the destruction is all within the shell, there is no evidence of any tumor formation outside the shell, and exploratory incision reveals within the bone shell a mass of fibrous tissue difficult to distinguish from sarcoma in the gross and frozen section, it is quite safe to diagnose *osteitis fibrosa*. Conservative measures are therefore in order. If there are many minute cysts or 1 large cyst, and if the patient is under 20 years of age, this is still more positive evidence that the lesion is benign.

H. W. Meyerding (Jour. Amer. Med. Assoc., Feb. 5, 1927) enumerates the bone tumors, progressing from the traumatic and infectious through the benign to the most malignant, thus: (1) Inflammatory lesions simulating bone tumors (callus, ossifying hematoma, syphilis, non-suppurative osteitis of Garré, Brodie's abscess, tuberculosis); (2) osteitis fibrosa cystica; cysts; (3) benign osteogenic tumors (exostosis, osteoma, chondroma, fibroma); (4) giant-cell tumors; (5) angioma; (6) endothelioma (Ewing's tumor); (7) periosteal fibrosarcoma; (8) osteogenic sarcoma; (9) multiple myeloma; (10) metastatic tumors. With a complete history, clinical examination, urinalysis, Wassermann test, and roentgenogram, an expert may diagnose correctly 9 out of 10 cases. In a small group, diagnosis is impossible until the tumor has been explored and macroscopic and microscopic character determined. The *endotheliomas* show a laminated appearance of the cortex, slowness of growth, and a diffuse swelling of the shaft which is usually local, but may be multiple. Metastasis occurs, but a favorable temporary reaction may



be obtained with **radiotherapy**. *Periosteous fibrosarcoma* apparently arises from the periosteum, causes bone absorption by pressure, and is usually of rather slow growth and fairly well encapsulated.

**TREATMENT.**—According to Bloodgood (Radiol., Mar., 1927), if there is any doubt from the X-ray or microscopic study as to the presence of definite malignancy it is best to treat the condition as benign, because the chances of its being such are the greater and the probability of curing a malignant condition is as yet far too slight to justify an **amputation** or **resection** unless malignancy is certain. In *giant-cell tumors*, **radiation** treatment alone is still in the experimental stage. **Curettement**, properly performed, should yield a cure in practically every case. In *central lesions* of the epiphysis in which the bone shell is intact, exploration should be done. If the shell is partly or completely destroyed the patient may be given the benefit of **radiation** first. This applies also to central tumors of the shaft. As yet, practically the only verified cures of bone *sarcoma* are those that have followed **amputation** for lesions of the lower extremity below the upper  $\frac{1}{3}$  of the femur. In the upper extremity of the femur, if **resection** with restoration of function cannot be done, **radiation** is necessary. Although occasionally successful, radiation has not as yet accomplished much. It has been more beneficial in sarcoma of the soft parts. No harm is done by **pre-operative radiation**, but operation must not be long delayed. In *secondary bone tumors* radiation is indicated for the relief of pain, but does not cure.

W. B. and B. L. Coley (Arch. of

Surg., Dec., 1926, and Jan., 1927) have described the end-results in 170 operable *primary malignant tumors* of long bones. The prognosis is by no means hopeless; it depends largely on early diagnosis and most careful selection of treatment. **Amputation** offers little hope of permanent cure in any type. Primary treatment with **radium** or **X-rays**, however vigorous, has not yet cured any unquestionable case. The **mixed toxins** have cured a certain number—all of the round- or spindle-cell type. The **mixed toxins and radium** combined have caused disappearance and apparent cure of an even larger number of cases of a similar type. **Amputation followed by** prolonged treatment with the **mixed toxins** in 38 consecutive cases showed 50 per cent. alive 3 to 18 years; this series included all types of osteogenic sarcoma, as well as the cases associated with marked new bone formation. In a similar series treated by amputation alone without toxins or radium before or after amputation, no patient remained alive after the 3-year period.

The choice of treatment in a given case depends on whether it belongs to the round-cell sarcoma or to the group with marked new bone formation. If it is of the 1st group, it is safe to try the combined **toxins and radium**, to be continued, if marked improvement occurs, until the tumor has disappeared; if not, in 4 to 6 weeks **amputation** should be performed, followed by prolonged **toxin** treatment. In the 2d group, **amputation** at the earliest possible moment followed by prophylactic **toxin** treatment offers the greatest hope of saving life. The fact that 10 inoperable cases in the series were success-

fully treated with **mixed toxins** alone or combined with **radium**, the patients remaining well 5 to 24 years later, should prevent loss of all hope in inoperable cases.

According to E. Gold (Arch. f. klin. Chir., May 6, 1926), the *giant-cell tumor* of long bones is a benign reactive hyperplasia of the bone marrow. The best treatment consists of simple **excochleation** followed by **irrigation** of the cavity in the bone with **hot water**.

In *metastatic carcinoma* in bone, G. E. Pfahler (Acta radiol., vii, 280, 1926) has obtained prolongation of life from 1 to 4 years by **X-ray** treatment. By far the most common primary growth is in the breast, and next to it the prostate, uterus and thyroid. Occasionally metastasis is found before the primary disease is recognized or complained of. The *spine* is oftenest involved and should be studied by X-ray in all advanced cases associated with other evidences of metastasis. Healing can be obtained with the X-ray even when pathologic fracture has occurred. One may expect best results from the **high-voltage** technic (200 to 240 K. V.). The writer gradually delivers 50 to 80 per cent. of an erythema dose of rays to the skin over the affected part at the beginning and utilizes enough portals of entry on other days to obtain a 100 per cent. depth dose within 10 days to 2 weeks. The radiation effect is then held at this point (saturation) for another period of 1 week. After this, a 50 per cent. dose delivered at an interval of 1 month will probably give the best results. Usually after 2 months one detects evidences of new lime deposit, which gradually increases. When well, the entire dis-

ease area is more dense than the surrounding bone. The object in treatment is to destroy the diseased cells but not the osteoblasts, upon which recalcification depends. Histories of 5 cases, with X-ray illustrations, are given, in which life was prolonged for 1 to 4 years. No deleterious effects of the radiation on the blood or general condition were noted in any case. J. Borak (Arch. f. klin. Chir., Oct. 18, 1926) similarly urges **X-ray** treatment of metastatic bone tumors, stating that no tumors are more sensitive to the X-ray than these. Often the bone metastases are the only ones present, and may remain solitary for years. Both the local symptoms and general condition are improved by the treatment.

Of 4 cases of bone metastasis in *hypernephroma* seen by R. Alessandri (Policlin., June 15, 1926), the metastasis showed a pulsating quality in 3. Since such a bone metastasis may be the only one, excision of the primary tumor, which may yet be small, should be given consideration.

**BORAX.—POISONING.**—J. Birch (Brit. Med. Jour., Feb. 4, 1928) records a case of fatal poisoning by borax in an infant 14 days old. It had undergone great emaciation during the 3 previous days, and had been given 1½ drams (6 Gm.) of borax in the form of various mouth-washes, which had been recommended by a nurse to prevent thrush. This large dose had been absorbed within the last 5 days. The child was found unconscious, with all the limbs closely flexed against the trunk. Temperature was subnormal, and the stools were typical of "cooked spinach." The most striking feature was the bright red appearance, which made the finger-nails and terminal phalanges of the left hand seem as if painted. There was a similar coloring over the scrotum, the lips, and round the anus. Post-mortem, the same pinkness was seen in the muscles and the arterial blood.

**THERAPEUTICS.**—In gastric diseases, especially with hyperacidity, J. Garcia Espin (Arch. esp. de enf. del ap. dig., Sept., 1927) had favorable results with borax, generally given in a daily dosage of 30 to 45 grains (2 to 3 Gm.), in a 1:150 or 1:200 solution. After 10 days' administration, a rest period of 8 days was allowed. The drug caused an almost immediate amelioration of pain and acidity.

**BOTULISM.**—In the United States and Canada from 1899 to 1928, including 1 outbreak from England and 1 from Argentina, 156 outbreaks have been reported (Special Article, Jour. Amer. Med. Assoc., Mar. 10, 1928), comprising a total of 529 cases with 357 deaths (case mortality about 67.5 per cent.). In 1927, 5 outbreaks occurred. All were due to home-canned foods, comprising corn, 2; string beans, 2, and pears, 1. All occurred in the western states, which accords with the established fact that the distribution of the spore of *B. botulinus* in the soils of western states is wide. Spoilage of the foods consumed was visibly present in 4 outbreaks, and probable in the 5th. Of the 11 cases comprised in the 5 outbreaks, 10 died.

According to Starin (Jour. of Inf. Dis., May, 1927), both the A and B types of *Clostridium botulinum* are capable of producing toxin in corn, peas and salmon that will withstand exposure to drying, light—both diffuse and direct—and seasonal variations of temperature for at least 90 days. Putrefaction of vegetables and meats which were originally highly toxic does not cause a disappearance of the toxin.

**BRAIN.—ABSCCESS.**—According to C. P. Symonds (Proc. Roy. Soc. of Med., May, 1927), in the course of

formation of every cerebral abscess there is a pre-suppurative stage of inflammation which in some cases may become arrested and resolve without pus formation. This would explain the cases in which the signs of abscess are present at 1 time but disappear without the evacuation of pus. He reports 3 such cases—1 that of a boy who had 2 negative explorations over the right temporal lobe and ultimately recovered; another, that of a man with undoubted involvement of the left temporal lobe and recovery without exploration, and the 3rd, that of a boy with signs of a right temporal lobe abscess and recovery 6 weeks after a negative exploration. Adson has reported 3 similar cases in children, following otitis media. In 2, exploration was done but no abscess found; 1 recovered without exploration. Such cases show that when the general and local signs of cerebral abscess are present, a negative exploration does not necessarily mean that an abscess has been missed. In such a case, therefore, it may be wise to allow enough time for a possible spontaneous cure before proceeding to a 2d exploratory operation.

**DIAGNOSIS.**—Among R. Lund's (Hospitalstid., July 28 and Aug. 4 and 11, 1927) 54 cases of *otogenic brain abscess*, recovery took place in only 10. Failure in diagnosis is the chief cause of the high mortality. In fully  $\frac{1}{3}$  of the cases the diagnosis was not made, and in only  $\frac{1}{2}$  was the abscess found. In the last 5 years, however, the results have been better; out of 17 cases, only 1 remained undiagnosed and in only 2 others was the abscess not found. Of 61 abscesses, 57 were in the temporal lobe or cere-

bellum, 2 in the occipital lobe, and 1 each in the parietal lobe and contralateral cerebellar hemisphere. The diagnosis of brain abscess is justified only when a possible primary focus is demonstrable. To elicit the slow pulse, it must be taken frequently, as it may vary a great deal. Abscess causes lesions of the cranial nerves oftener than any other ear complication, but primary meningitis may also cause them. Abscess more often affects the oculomotor, meningitis the abducens. As a rule the oculomotor paresis is not complete at the onset of the abscess, an isolated anisocoria or homolateral internal paresis being found. Differentiation of cerebral and cerebellar abscess is difficult, as the pressure symptoms are the same. Aphasia is the most important local brain symptom. The characteristic of the temporal lobe abscess is not word deafness, but the lack of word memory and paraphasia.

In exploring for abscess the writer employs *needle puncture* through the intact dura. This facilitates discovery of an abscess in the temporal lobe where one in the cerebellum is expected, and *vice versa*. In the absence of a preceding sinus phlebitis or complete destruction of the labyrinth, the puncture in suspected cerebellar abscess is made anterior to the sigmoid sinus through Trautmann's triangle, or, less often, posterior to the sinus if pachymeningitis exists there. If the sinus is thrombosed, it is opened and the cerebellum punctured through its median wall. In abscess of unascertained origin, where the labyrinth is destroyed, the puncture is made slightly less than 1 cm. ( $\frac{3}{8}$  inch) back of the internal auditory meatus, after removal of the labyrinth.

The spinal fluid in brain abscess is usually slightly turbid, but may vary much in different stages, from a very few cells to an opaque fluid. The cells in abscess are usually mononuclears, in meningitis polymorphonuclears—but not always. Variations in the spinal fluid cell count in the course of a meningitis complicating an ear condition point to abscess.

A case of cerebral abscess following *dental extraction* is reported by W. G. Robson (Jour. So. Afr. Med. Assoc., Mar. 12, 1927). There was much periapical necrosis and perialveolar bone absorption. On the 4th day after extraction of 4 teeth, following a violent sneeze, vision on the right side was lost. Constant, boring headache followed. On the 10th day, lumbar puncture yielded clear fluid under pressure. A provisional diagnosis of brain abscess was made. Death occurred the next day, and an acute abscess of hen's egg size was found in the occipital lobe.

Good results are reported by Rockey (Ann. of Surg., July, 1927) in the *X-ray diagnosis* of brain abscess by means of a 20 per cent. aqueous solution of sodium iodide.

**TREATMENT.**—Having noted that quite frequently acute infections in the brain had been transformed by nature's efforts into well walled-off chronic abscesses, suggesting that nature needed but little further help to obtain a cure, W. E. Dandy (Jour. Amer. Med. Assoc., Oct. 30, 1926) undertook to treat *chronic abscess* by simple evacuation of the pus by **tapping** on 1 or more occasions. In the majority of cases only a single evacuation proved necessary. A small perforator opening is made in the bone over the abscess, where it appears to be nearest the dura. A ventricular needle is introduced through a tiny nick in the



dura and left in until pus ceases to drip. The abscess is neither aspirated nor irrigated, to avoid stirring up the infection. The skin wound is closed tightly. A chronic brain abscess cannot collapse; eventually nature absorbs the contents and fills the defect with fluid, scar tissue, or both. The tiny dural opening precludes both a brain fungus and a fistulous tract, thus preventing a secondary infection. The procedure is of proved value in chronic abscess, but in acute abscess the outlook is far less hopeful; possibly a few cases may be helped from the acute to the chronic stage by tapping.

Rigid **metal cannulas** are used by O. Körner (Zeit. f. Hals-, Nasen- u. Ohrenh., Jan. 31, 1927) for the drainage of *otitic brain abscesses* after **incision**. Of 5 temporal lobe and 4 cerebellar cases thus dealt with, all but 2 recovered. Combined statistics from 8 operators using other methods showed only 41 per cent. of recoveries in cerebral abscesses and 7 per cent. in cerebellar abscesses.

According to J. Adam (Jour. of Laryng. and Otol., Feb., 1926), brain abscesses in cases of *bronchiectasis* are not metastases from the chest but secondary to the sinusitis which caused the bronchiectasis. In all cases of bronchiectasis the sinuses should be examined as a possible etiologic factor of both the bronchiectasis and any complicating brain abscess. The writer reports a case with nasal sinusitis, bronchiectasis and frontal-lobe abscess, treated with success by **drainage**.

Among Sir W. Milligan's (*ibid.*, Jan., 1926) cases of otitic brain abscess, cerebellar abscesses were more than twice as numerous as cerebral abscesses. When a diagnosis of *cerebellar abscess* has been made no

time should be lost in opening up the posterior fossa. Previous to this, however, he 1st relieves the intracranial pressure by **lumbar puncture**, this proving of value in numerous cases; the objections to it he believes to be theoretic rather than practical. Unless the patient is comatose, when rapid operation is essential, a **radical mastoid operation** should be performed and the **lateral sinus exposed**. The bone between the groove of the sinus and the internal auditory meatus should be freely cut away and as much dura exposed as possible. The dura is then incised and the antero-internal portion of the cerebellar lobe explored with a knife. Punctures should be made in several directions. If clinical indications point to abscess but no pus is found, an opening is made behind the sinus and the posterior portions of the cerebellum explored. To expose as much of the cerebellar lobe as possible, an attempt may be made to displace the sinus. If this is not feasible, the sinus may be opened, plugged, and resected.

**EMBOLISM.**—Ten cases of cerebral *air embolism*, with 5 deaths, are reported by G. W. Reyer and H. W. Kohl (Jour. Amer. Med. Assoc., Nov. 13, 1926) from among many thousands of intrapleural air insufflations. In 7 instances the patients were sitting up or rising from recumbency. Seven had severe pain at the site of operation; 4, nausea as initial symptom; 6, tonic and clonic convulsions; 6, visual disturbances; 6, unconsciousness. Nine showed evidence of pleural adhesions in the X-ray picture. Prophylaxis consists in careful study by X-ray and fluoroscope before the operation; use of a

large-caliber needle with blunt point; presence of free and negative manometer oscillations before the procedure; removal of needle upon signs of embolism, and keeping the patient prone at least 10 minutes after withdrawal of the needle, if the study revealed a possibility of air embolism. The treatment consists of **lowering the head** at once; administration of **adrenalin** or **strychnine**; **artificial respiration**, and **lowering the head of the bed** for about  $\frac{1}{2}$  hour after the symptoms have passed off.

**HEMATOMA, CHRONIC SUBDURAL.**—The hemorrhages producing this lesion differ symptomatically and pathologically from the meningeal type of epidural or subdural hemorrhage which generally follows head injuries, and resemble more closely the picture of pachymeningitis hemorrhagica interna of spontaneous origin. In all of the cases reviewed by C. W. Rand (Arch. of Surg., June, 1927), they were relatively late sequelæ to head injuries, some major but mostly minor, the patient coming to operation or autopsy 6 weeks to 8 months after the trauma. In every case a massive subdural hemorrhage surrounded by a discrete capsule was found. The bleeding is probably slow, of venous origin, allowing for compensatory accommodation up to a certain point, and occurs commonly in the frontal and parietal regions. It may be bilateral. Aside from the deformity due to pressure, little pathologic change is seen in the brain.

The symptoms, which may not develop until a long time after some trauma supposed to be very trivial, are variable, depending upon the position and extent of the hemorrhage. Increased intracranial pressure mani-

festes itself as usual. Choked disc is usually present and is often more advanced on the side of the hematoma. In the cases reviewed by the writer, the ages of the patients ranged from 13 to 90 years.

The results of **surgical intervention** are good. In some cases the formation of an osteoplastic flap and **removal** of the hematoma and sac may be the treatment of choice, but in 1 case an equally good result was obtained by **aspiration** through a simple trephine opening, the membrane being left *in situ*. Once removed, the hematoma does not tend to recur.

Reporting 8 cases of the condition, upon which emphasis has been placed of late, R. A. Griswold and F. Jelsma (Arch. of Surg., July, 1927) divide the symptoms into those due to increased intracranial pressure (headache, vertigo, vomiting, slow pulse and choked disc) and those due to localized disturbances (paralysis, aphasia, convulsions, etc). There may be any combination of symptoms; some may be fleeting or variable and atypical or incomplete. The common syndrome is headache, vertigo, vomiting, psychosis, coma and death. Increased reflexes, spasticities and cranial nerve involvements are common. The spinal fluid, usually normal, may be xanthochromic or bloody. In some cases there is no history of trauma. In 5 of the writer's cases there was a history of alcoholism.

**HEMORRHAGE.**—See also CEREBRAL HEMORRHAGE.

**INJURIES.**—Considerable divergences of viewpoint exist concerning the essential nature of *cerebral concussion*, manifestly on account of the difficulty of making direct tissue studies in a typically transient condi-

tion. According to experiments performed by G. G. Miller (Arch. of Surg., Apr., 1927), concussion is immediate in onset, and tends toward spontaneous recovery without production of sequelæ.

The chief symptom is unconsciousness, with or without medullary manifestations. Concussion appears to be due to direct mechanical action on the cells, causing a disturbance of cell equilibrium and temporary loss of function. The medullary effects are those of stimulation or paralysis of the respiratory, vagus and vasomotor centers. The respiratory center is the 1st to be paralyzed. As this is usually a temporary paralysis, **artificial respiration** may save life. Death from concussion is immediate, and is due to respiratory paralysis with consequent asphyxia.

On the other hand, M. Osnato and V. Giliberti (Arch. of Neurol. and Psych., Aug., 1927) deem it no longer possible to say that concussion is an essentially transient state which does not comprise any evidence of structural cerebral injury. Not only is there actual cerebral injury in concussion, but in a few instances complete resolution does not occur, and it is very likely that secondary degenerative changes develop. In this event the condition clinically resembles some of the reactions seen in encephalitis. The post-concussion neuroses could more properly be called cases of traumatic encephalitis. Similarly, according to H. Krisch (Deut. med. Woch., Apr. 29, 1927), organic disturbances following brain concussion are often underestimated. Vasomotor manifestations, forgetfulness, and hypersensitiveness to sensory stimuli and to alcohol and

nicotine are common evidences of these disturbances.

According to B. M. Vance (Ann. of Surg., May, 1927), out of 507 cases of skull fracture, 139 died from cerebral concussion. He regards the latter as a clinical entity with a pathologic basis which our present methods of examination cannot demonstrate. Fatal cases of concussion can occur without any skull fracture and without any visible evidence of brain injury. Evidently, there is no necessary connection between the concussion and the actual physical lesions in the cranial organs. In persons sick, senile, alcoholic or otherwise below par, a slight injury may be just as fatal as extreme violence in a healthy person. Of the 139 deaths from concussion, 86 took place in a few minutes, 34 in 1 to 4 hours and 11 in 5 to 10 hours; in 8 the interval was unknown. L. Schonbauer (Beitr. z. klin. Chir., cxxxvii, 611, 1926) has reported experiments in dogs indicating that concussion causes an acute edema and swelling of the brain tissue, as evidenced by reduction in size of the X-ray air shadows (ventriculography) due to compression of the ventricles of the brain.

**TREATMENT.**—Discussing 100 head injuries, comprising 25 basal fractures with 14 deaths, and 61 fractures of the vault with 10 deaths, A. G. Rutherford (South. Med. Jour., May, 1925) describes the treatment followed thus: If the systolic pressure falls below 60 mm. Hg, or if the temperature is markedly subnormal, *shock* is considered to exist. The head is **lowered**, **external heat** applied, **adrenalin** given hypodermically, and also **subcutaneous saline infusions**. The external lacerations are gently

cleansed and covered with sterile gauze. **Magnesium sulphate**, 3 ounces (90 Gm.), in water, 6 ounces (180 c.c.), is given by **rectum**. When the temperature has risen to normal and the systolic pressure to 60 or above, shock is considered over; the patient is X-rayed and a neurologic examination made. **Lumbar puncture** is carried out and manometer readings taken. If the pressure is below 12 mm. Hg, the patient is usually left alone. If the fracture is basal, nothing further is done unless the pressure exceeds 16 mm., when **subtemporal decompression** is considered. If the neurologic signs point to definite irritation or cortical involvement, there is increase in coma, or there is a difference in temperature on the 2 sides which denotes cortical pressure from hemorrhage, operation is performed on the side on which the irritation is thought to be. If the neurologic signs are vague, decompression is omitted, however high the intracranial pressure may be. **Lumbar puncture** is performed as often as every 10 hours and the pressure gradually reduced by the removal of limited amounts of fluid. If, however, the pulse and respiration continue depressed and the pulse pressure continues to rise until it equals the pulse rate, 100 c.c. ( $3\frac{1}{3}$  ounces) of 35 per cent. salt solution is given **intravenously** at the rate of 1 c.c. (16 minims) per minute, after which **decompression** is considered. Where the patient is *not in shock*, the head is **elevated** on pillows and surrounded by **ice-caps**. Sedatives such as **chloral hydrate** and **bromides** are given by **rectum** and **phenobarbital** by the mouth. For the 1st 48 hours, **magnesium sulphate**,  $\frac{1}{2}$  ounce (15 Gm.),

is given every 2 hours. The patient is kept at **rest** for at least 4 weeks.

In cases of head injury with gradually increasing intracranial pressure, C. E. Dowman (*ibid.*) endorses the use of  $\frac{1}{2}$  ounce (15 c.c.) of saturated **magnesium sulphate** solution by mouth every 2 hours for the 1st day or 2. The intervals are then lengthened to 3 hours for a day or 2, and the drug then gradually decreased according to the condition, being withdrawn entirely usually in 7 to 10 days. Excessive purgation is prevented by not allowing any plain water but giving merely a sufficient amount of lemonades, broths, etc. Within 12 hours after starting the treatment the spinal pressure was nearly always found to have dropped below normal, often declining, *e.g.*, from 30 mm. Hg to 3 or 4 mm. The action of magnesium is much slower, but more prolonged and much safer, than that of **sodium chloride**, which is, however, the agent of choice for rapid depletion, provided the edema that may result will not cause a condition more serious than that previously present.

According to M. M. Peet (Jour. Amer. Med. Assoc., June 27, 1925), the rapid reduction of intracranial tension required in acute trauma unattended with shock is best effected by the **intravenous** use of **hypertonic Ringer's solution**. **Glucose** may later be given to maintain the lowered pressure. Glucose has the following advantages over salt solutions: Prolonged action, no terminal rise in pressure, non-toxicity, non-dehydration, increased blood-volume in shock, and the control of acidosis. When acute pressure is associated with shock or hemorrhage, and in the less



acute cases when complicated by dehydration, nausea and vomiting, **hypertonic glucose solution** intravenously is indicated.

*Extradural hemorrhage* and the syndrome of rupture of the middle meningeal artery are regarded as rather uncommon by F. C. Grant (Prog. Med., Mar., 1928), who saw only 11 such cases in over 700 patients with head injury. Operation was undertaken some 20 times on this diagnosis only to find a contused cortex, diffuse subarachnoid clot, or small subdural clot. The time element in making the diagnosis of extradural hemorrhage is most important. If the unilateral weakness or paralysis comes on simultaneously with, or immediately after, injury, the condition is almost certainly a contused cortex or diffuse subarachnoid clot, and not extradural hemorrhage. It requires time for the middle meningeal to bleed, to dissect the dura away from the skull, and for a clot of sufficient size to gather to affect the motor cortex. Further, the contralateral face, arm and leg are usually involved in that order, in sequence. The neurologic signs tend to develop progressively as the hemorrhage spreads. The diagnostic features, according to Carter, are the history, hemiplegia, dilatation of the ipsilateral pupil, and a clear spinal fluid under high pressure. A pupillary dilatation often occurs on the side of the hemorrhage (Vance). Once the diagnosis of extradural hemorrhage is made, measures to **evacuate the clot** should be taken promptly.

H. Claude, A. Lamache and G. Dubar (Paris méd., Mar. 24, 1928) investigated the *cerebrospinal fluid* in

22 cases of skull trauma without fracture but followed by various subjective complaints, such as headache, dizziness, weakness, insomnia, tinnitus, and abnormal visual fatigability, coming on several days after the accident. The trauma had been produced in various ways, such as a fall from a bicycle or scaffold, an automobile or railroad accident, or a blow on the head while playing football. In most instances several weeks or even months had elapsed before the patient came under observation. Frequently an excess of albumin in the cerebrospinal fluid was found. Pandy's test for globulin was always negative. The amount of sugar was variable and devoid of any apparent significance. Generally the cell content was normal, although in 2 cases of rather recent trauma 2 and 3.5 lymphocytes per cu. mm. were found.

The most significant changes related to the pressure of the spinal fluid. Most often hypertension was found, ranging usually from 25 to 35 in the recumbent position. In 1 case with a pressure of 50, headache was very persistent and yielded only to 2 **lumbar punctures**. Hypotension occurred in only 3 cases. Other cases showed an instability of pressure, causing marked difficulty in deciding upon the pressure existing in the individual case, with unusual jumps of 15 to 25 under the influence of moderate external factors. In the cases with *hypertension*, headache is practically constant, but undergoes exacerbations under the influence of abrupt movements or cold, during the digestive period, and in recumbency. Cases with *hypotension*, on the other hand, are more comfortable in recumbency and have pain on rising in the morning. One of the patients with an unstable pressure had paroxysms of headache brought on by fatigue or slight emotional impressions; there were abrupt vasomotor changes in the face, with mydriasis, an unstable pulse, and frequent sweats.

Where hypertension exists the treatment consists of withdrawing fluid by

**lumbar puncture**, or, as an unreliable substitute, daily **ingestion of concentrated salt or sugar solutions**. Hypotension is met by **pituitary extract**, **theobromine** and 3 or 4 **intravenous injections of 15 c.c. ( $\frac{1}{2}$  ounce) of distilled water**. Chronic hypotension, however, is hard to overcome. In 1 instance lumbar puncture proved alone effective, causing in 24 hours a stimulating action on the fluid-producing structures with secondary hypertension, demonstrable by determination of the retinal pressure with Baillart's ophthalmodynamometer. In cases with unstable pressure, **ergotamine tartrate** should be tried.

According to W. Penfield (Surg., Gyn. and Obst., Dec., 1927), chronic *post-traumatic headache* is relieved by **lumbar air insufflation** (encephalography). He reports 7 cases, all treated with success. The ages ranged from 4 to 65 years. The head injury had occurred 4 weeks to 8 years before. In only 3 could a fracture be proved. The amount of air injected ranged from 42 to 95 c.c. An immediate reactionary headache lasted from 3 or 4 up to 9 days after the insufflation. It is important to keep uppermost as much as possible the side of the head on which the headache was habitually most severe; the erect position is prohibited for a few days, for in this position the air goes to the vertex and remains there. In the cases susceptible of cure by this measure headache and dizziness are the cardinal symptoms. The headache, while it may spread to some extent, is definitely referred to 1 part of the head. In most cases the pain is situated near the site of the blow, with some tendency to radiate forward. The headache is usually dull, occasionally hammering or stabbing, and is ordinarily made worse

by stooping, lifting or blowing the nose. It is usually present daily, and often increases steadily in the morning and may be troublesome again in the late afternoon. In some it prevents sleep; others are free from it at night. Vertigo may come on in walking, rising from a chair, or at any time.

**PNEUMOCEPHALUS.**—A case of traumatic pneumocephalus recorded by A. Krogus (Finska läk. handl., July, 1925) is 1 among the fairly numerous instances of this condition recently reported. The patient's paroxysmal intense headache with frequent vomiting and escape of a colorless fluid from the nose after an accident involving the head were accounted for by a basal fracture and accumulation of air in the ventricles. There had been serious injury in the frontal region, with unconsciousness for 48 hours and profuse epistaxis. X-ray plates showed on each side of the midline a large clear space, more extensive on the right side. Lateral views showed that the air was in the lateral ventricles. The right frontal bone was trephined and the **ventricle punctured**, whereupon cerebrospinal fluid mixed with air bubbles escaped. Death occurred on the 3d day. At the base of the frontal lobes was found a focus of softening communicating with the lateral ventricles and, through a hole in the ethmoid, with the right nostril. Out of 8 cases of traumatic pneumocephalus 5 recovered.

**TUMORS.—DIAGNOSIS.**—Brain tumor would much less frequently escape diagnosis, as stated by C. E. Locke (Ann. of Clin. Med., June, 1927), if every case of persistent headache were examined ophthalmo-

scopically. In about 20 per cent. of the cases, choked discs are not present. The diagnosis of these cases depends on the slowly progressive nature of the localizing signs. Where primary optic atrophy is present without syphilis or multiple sclerosis, the visual field should be examined and a roentgenogram of the sella turcica made to ascertain the presence or absence of pituitary tumor.

The relative frequency of brain tumors in *children* is pointed out by H. Cushing (Amer. Jour. Dis. of Childr., Apr., 1927). Of 1108 verified brain tumors, 154 occurred in children below 15 years. Most of the tumors producing symptoms in children are gliomatous. Of 354 verified gliomatous tumors, 116 were found in children under 15; of these, 77 were in the cerebellum and 36 in the cerebral hemispheres. Most of the children had enlarged heads giving Macewen's sign on percussion and this enlargement was commonly followed by a cessation of headache, with subjective freedom from discomforts. In several cases, however, by the time this subjective improvement occurred, vision had begun to fail, and had not infrequently been lost before the seriousness of the malady was appreciated. These patient's may often appear so well, in spite of their bouts of vomiting, that the advanced grade of choked disc may come as a total surprise, for children are not as prone as adults to complain of a slight obscuration of vision. Vomiting is apt to be the dominating feature at the outset, and may be regarded as a symptom of localizing value. A median tumor of the cerebellum is so common a lesion in preadolescence that when a child

has unexplained vomiting, shows a possible enlargement of its head and gives a history of periodical unsteadiness, it is well to be on guard and have a look at the eyegrounds every week or 2.

The *gliomas* in children are not all as seriously malignant as is commonly thought. In medullo-epithelioma the life expectancy is 8 months; spongioblastoma, 12 months; medulloblastoma, 17 months, and astrocytoma, 72 months. Less than 1 per cent. of *spongiomas* occur in childhood. The *medulloblastomas* are essentially tumors of childhood, occur in the mid-cerebellum, and as they arise from the 4th ventricle, their removal is very difficult. The *astrocytomas* usually arise similarly, but are slow growing and more easily removed.

Of *congenital tumors* in children the majority are suprasellar, and disturb pituitary function. In about 80 per cent. of the cases the cyst walls were calcified. Results of treatment were not very favorable as to cure.

There were only 6 *tuberculomas* in the series, in contrast to the old statistics which gave their incidence as 50 per cent. They are most frequent in the cerebellum. It is best not to remove them. The ultimate prognosis is more unfavorable than that of most true neoplasms. In 2 cases detailed, palliative **decompression** relieved all symptoms, except blindness in 1 case.

The ratio of cerebellar tumors to cerebral lesions in children is 2:1, whereas in adults it is 1:5.

The *pineal shadow* as an aid in the localization of brain tumors is emphasized by J. H. Vastine and K. K. Kinney (Amer. Jour. of Roentg., 1927). In 616 examinations, the pineal gland was sufficiently calcified

to cast a shadow in 47.9 per cent; in patients over 20 years, in 59.2 per cent.; in males, in 58 per cent.; in females, in 46 per cent. By plotting certain measurements on cross-section paper, the normal anteroposterior and vertical variations in the position of the pineal were determined. Then, in 153 cases of verified brain tumor with visible pineal, the pineal shadow was found displaced in 51 per cent. of the cases of glioma, 57 per cent. of those of meningioma, 22 per cent. of acoustic neuromas, and 10 per cent. of pituitary tumors. Hydrocephalus displaced the gland in 13 per cent.

In *acoustic neuroma*, E. B. Towne (Arch. of Otolar., Dec., 1926) finds that upon taking an occipitomenal film to show in silhouette the posterior edge of the petrous portion of the temporal bone and the foramen magnum, an erosion by the tumor in this petrous region can be clearly distinguished.

From 14 cases of basal *frontal lobe* lesions (tumor or abscess), W. I. Lillie (Trans. Amer. Med. Assoc., May, 1927) worked out the following ophthalmologic syndrome, deemed characteristic, and the accuracy of which was proved by surgery or necropsy: (1) Homolateral diminution of central vision, due to scotoma; contralateral normal central vision; (2) homolateral normal fundus, or simple atrophy or choked disc; contralateral choked disc; (3) in a bilateral lesion, bilateral central scotoma with bilateral choked discs.

A case of frontal lobe tumor *simulating epidemic encephalitis* with Parkinson's syndrome has been reported by E. L. Hunt and J. R. Lisa (Jour. Amer. Med. Assoc., Nov. 12, 1927). A man aged 29, who had contracted grip the year before, came to the hos-

pital complaining of lethargy, diplopia and headaches. Physical examination revealed dilated and sluggish pupils, a coarse tremor of the hands, exaggerated reflexes, and a typical mask-like face and attitude. The optic discs were slightly hazy. Laboratory data were negative. In the hospital he developed facial paralysis, yawning and a change in disposition. He became much slower, both physically and mentally, and died within a few days. The physical signs were typical of the parkinsonian syndrome. Necropsy revealed a glioma of the frontal lobe, extending toward the basal ganglion and impinging on it.

Regarding the differential diagnosis of *pineal tumors*, G. Horrax (Arch. of Neurol. and Psych., Feb., 1927) finds that a history starting with pressure symptoms is strong evidence in favor of such a tumor, whereas the cases that begin in other ways, as with diplopia, squint, numbness or weakness of 1 side, facial palsy, and the like, are almost certainly *pontile* lesions. When difficulty in hearing existed, it was always recognized subjectively as bilateral by the pineal cases, and always referred to a single ear by the pontile. Pressure on the sensorimotor pathway was manifested only twice, and that very slightly, in the pineal cases; of the pontile cases, 60 per cent. had a definite hemiplegia or hemihypesthesia, always opposite a facial weakness if such existed. Conjugate movement of the eyeballs upward above the horizontal plane was impossible in 47 per cent. of the pineal cases, but in none of the pontile cases. Peripheral involvement of the 5th, 7th, 9th and 12th cranial nerves was practically absent in the pineal cases, while relatively frequent in the pontile.



Reporting 12 cases of *metastatic tumors* of the brain, J. H. Globus and H. Selinsky (Arch. of Neurol. and Psych., Apr., 1927) state that an acute onset of cerebral symptoms, followed rapidly by neurologic signs of a disseminated character and symptoms of increased intracranial tension, in the absence of changes in the discs and serologic or febrile manifestations, suggests strongly a metastatic neoplastic process. The probability is strengthened further by the rapid evolution of neurologic signs and the appearance of progressive wasting and of asthenia out of proportion to that usual in primary brain tumors.

Under such circumstances, search should be made for the primary malignant focus.

Early evidences of brain tumor, according to C. L. Carlisle (Med. Bull. U. S. Vet. Bur., Apr., 1927), may consist of complaints of stomach trouble, general failure of health, vague visual disturbances or rather mild headaches and a feeling of inability to go on working. Any patient with psychoneurosis of the neurasthenic type, with symptoms relating to the eye and stomach, and head sensations, including visual hallucinations (especially when on a non-toxic basis), should receive sufficient observation and later reexaminations to exclude or include the triad: Choked disc, vomiting due to an organic brain lesion, and headaches from organic lesions.

Since destruction of the sella turcica may take place in any brain tumor, such destruction is of value in tumor localization, according to H. Harms (Münch. med. Woch., Feb. 18, 1927), only when other evidences,

particularly bitemporal hemianopsia, are present.

F. C. Grant and L. Fisher (Jour. f. Psych. u. Neurol., Oct., 1926) obtained 89.4 per cent. of correct localizations among 116 cases of intracranial lesions in which the *vestibular tests* were used. Ordinary clinical examination makes the diagnosis in many instances without the aid of these tests, but in early or difficult borderline cases they may be of conclusive importance. The following definite group-responses are formulated: I. Cerebellar lesions: (a) Poor pelvic girdle movements; (b) marked tolerance to vestibular tests; (c) interference with vertigo and past-pointing responses; (d) predominant signs of intracranial pressure. II. Cerebello-pontile angle lesions: (a) Totally impaired 8th nerve on side of lesion in both cochlear and vestibular divisions; (b) loss of function of vertical canals on opposite side, but good function from horizontal canal with good hearing. III. Supratentorial lesions, mid-line or hemispheric: (a) Marked susceptibility to vestibular stimulation; (b) conjugate deviation of eyes to side of lesion; (c) exaggeration of nystagmic responses over vertigo and past-pointing responses; (d) no evidence of cerebellar hemispheric lesion, though increased intracranial pressure may interfere with vertical canal responses.

**TREATMENT.**—The surgical treatment of brain tumor is not as hopeless as one finds it stated in the literature, according to G. Hener (Cincinnati Jour. of Med., viii, 221, 1927). The results are more favorable than in many other malignant conditions. Among 850 cases analyzed, there lived beyond a 3-year period after discharge from the hospital, of solid gliomas, 8 per cent.; cystic gliomas, 56 per cent.; gliomatous cysts, 50 per cent.; endotheliomas, 53 per cent., and pituitary adenomas, 50 per cent. Many cases have lived 5 to 10 years.

E. Sachs (South. Med. Jour., Mar., 1927) notes that the greatest need for progress in the surgery of brain tumors is in the solid gliomas. While relief for a period of months is given in 80 per cent. of the cases and relief for a few years in some cases, cure is very rare. Of the gliomatous cysts 90 per cent., and of the endotheliomas 80 to 85 per cent. are cured.

The operative mortality in various groups of verified tumors in Cushing's clinic, as recorded by W. Lehmann (Arch. f. klin. Chir., cxliii, 552, 1926), comprised: Gliomas, 13.7 per cent.; acoustic nerve tumors, 12.4 per cent.; meningiomas, 18.2 per cent.; ependymomas and papillomas of 4th ventricle, 37.5 per cent.; cholesteatomas, etc., 20 per cent.; tuberculomas, 50 per cent. The general operative mortality in 266 verified tumors in which 368 suboccipital decompressions were done was 16 per cent. In 27 verified cerebral tumors in which mistaken exploration of the posterior fossa was carried out it was 59.2 per cent.

O. Hildebrand (Deut. Zeit. f. klin. Chir., Mar., 1927) operated on 12 cerebellopontile angle tumors, with a mortality of 50 per cent. Gliomas and sarcomas are very subject to recurrence after removal. The best treatment is **X-ray** therapy after exposure. In peritheliomas and endotheliomas the outlook is better. Fatal collapse not infrequently follows operation on cerebellopontile angle tumors, but the operation is indicated in spite of this risk.

Discussing meningiomas of the frontal base, H. Cushing (Lancet, June 25, 1927) reports improved operative possibilities resulting from the employment of **electrosurgery**.

The object sought is the partial intracapsular excavation of the tumor in order that its walls may be collapsed and the large growth brushed away from the brain and removed with minimal contusion of the nervous tissues. The great vascularity of these tumors has often necessitated successive-stage operations. The electro-surgical unit used by the writer combines both the coagulating and cutting currents, and through the agency of a pistol grip the current can be let on or off by the operative finger pressing a trigger. The frequency of current oscillation is increased from the usual 500,000 or 700,000 cycles a second employed in diathermy to 1,500,000 cycles. The current is so powerful that, for purposes of cutting and coagulating, a loop can be used instead of the straight needle. By a modification of the character of the current the degree to which the incised tissues are coagulated can be controlled. The 1st case dealt with with this device could not have been done even in multiple sessions by earlier methods. Seven hours were consumed in the removal of the growth at 1 sitting. During the last hour, the patient's circulation beginning to weaken, a **blood transfusion** of 500 c.c. was given, with immediate improvement, followed by uninterrupted convalescence, the operation leaving an almost invisible scar, owing to the possibility of preserving the bone-flap. In 2 later similar operations, 5 and 9 hours were consumed.

In extensive **decompression** operations, A. Young (Glasgow Med. Jour., June, 1926) adopts a procedure calculated to support the bulging brain. The 1st very large skin flap includes all the scalp layers except the peri-

cranium, and is turned downward. A 2d, smaller flap of temporal fascia and pericranium is next turned upward. The skull having been opened widely, the dura is opened by raising a 3d flap, which is turned downward. This dural opening is sufficiently smaller than the bone gap to provide protection of the brain by the dural margins from pressure and laceration by the bone edges. The brain having been dealt with, the 2d flap is brought down and sutured to the free edge of the dural or 3d flap, or, if there is excess, to such a level of this as to give the necessary degree of support to the bulging brain, the excess either being used to reinforce the support or being cut away and used to make good any defects at the lateral margins or angles of the gap. After hemostasis of the 1st or scalp flap, it is replaced and its edges carefully and closely sutured in place. A copious absorbent external dressing, firmly bandaged, is then applied over the whole.

According to C. A. Elsberg (Ann. of Surg., Jan., 1928), in states of increased intracranial pressure a perfectly satisfactory decompression can be obtained if only the outer dural layer is excised, the inner being preserved. The outer layer is used for the plastic closure of dural defects.

Among 1000 verified brain tumors observed at the Peter Bent Brigham Hospital, van Wagenen (Arch. of Neurol. and Psych., Jan., 1927) found only 14, or 1.4 per cent., of *tuberculomas*, all but 3 in the cerebellum. In 6 cases the tumor was **excised** (in 5 from the cerebellum) with death from recurrence, usually by a terminal meningitis within 3 months. Only 1 patient lived over a year without local recurrence. In the other 11 cases, **palliative treatment** alone was employed; of these, 1 patient was alive and well 6 years later.

**IRRADIATION.**—Discussing 136 intracranial tumors treated by **irradiation** in the course of 13 years, H. K. Pancoast (Amer. Jour. of Roentg., Jan., 1928) states that in the cerebellar group of 48 cases, 25 are known to be alive for varying periods of a few months to 13 years. Uniformity of irradiation technic is absolutely essential and does not now exist. A proper combination of external irradiation and **radium implantation** may be found necessary in many tumors if histologic prognostication becomes possible.

Apparent success of irradiation may frequently be the result of the operative procedure acting as a decompression.

According to H. Baruk (Paris méd., Dec. 3, 1927), gliomas and tumors of the pituitary are particularly sensitive to the **X-rays**. Where a tumor is extremely radiosensitive and no marked evidences of cerebrospinal hypertension exist, preliminary **decompression** is not absolutely essential if the dosage of rays is measured with care.

A. Bécère (Jour. de radiol. et d'électrol., Dec., 1926) states that the most serious untoward results of **X-ray** treatment of intracranial or cord tumors are of mechanical origin, hyperemia and swelling of the irradiated tissues causing increased compression. If the initial dose is large, these effects sometimes occur on the day of the 1st exposure. The dose should be especially moderate in cases already with compression by the tumor. It is well to determine the spinal fluid pressure before the X-ray treatment is begun, and regulate the dosage accordingly. Large doses of the ray, given at long inter-

vals, are less satisfactory than moderate doses frequently repeated.

According to Sæthre and Jorgensen (Norsk. Mag. f. Læg., June, 1926), preliminary **decompression** is quite necessary previous to **X-ray** treatment, both as an aid in treatment and as an outlet for the increase of intracranial pressure nearly always occurring after the exposures. Among 11 cases treated with the X-ray, all improved but 2. There was a clinical cure in 6, even including 1 in which decompression had been omitted. In this case the shadow of the frontal tumor disappeared, but vision on the right remains deficient. The 9 survivors have lived 8 to 36 months since treatment. Of the 2 cases that died, both having gliomas in the motor region, 1 lived a year after treatment and the other not quite 3 years. In 1 of the successful cases, epileptic seizures had returned, with choked disc, 18 months after subtemporal decompression. Under 7 courses of 2 to 3 exposures each during 2 years, recovery seemed complete during the nearly 2 years since elapsed. That this tumor was in the uncinat convolution was suggested by paresthesias of taste and smell.

Bailey and Cushing ("Tumors of the Glioma Group," Phila., 1926) regard the medulloblastomas as responding favorably to radiation, presumably because of being made up of a young embryonic type of cell.

In a case reported by Lechelle, Baruk and Ledoux-Lebard (Bull. Soc. méd. des hôp. de Paris, June 9, 1927), mental disturbances suggesting early general paralysis were observed. Intracranial hypertension was shown by lumbar puncture and the eye-grounds. Tumor in the frontal lobe and corpus callosum was diagnosed, and **deep**

**X-ray** treatment applied over the frontal and parietal regions, to a dosage of 4000 to 5000 Behnken units in each field. Two series of tri-weekly exposures, 3 weeks apart, were given to a total of 22 exposures. The mental condition improved rapidly and even the choked disc decreased considerably. There had been no preliminary decompression. The X-ray is deemed by the writers beneficial in particular in gliomas.

**BROMIDES.**—A simple *color test* for bromine in the body fluids is described by G. H. Belote (Jour. Amer. Med. Assoc., May 28, 1927) as follows: Small strips of filter paper are soaked in a saturated solution of fluorescein in 60 per cent. acetic acid, allowed to dry, and may be kept indefinitely as indicators. To the suspected body fluid, in a test-tube, are added a few crystals of potassium permanganate. After agitation, a few drops of concentrated sulphuric acid are added, and after this, the fluorescein paper is held, having been moistened with 2 per cent. acetic acid, at the mouth of the tube. Even minute amounts of bromine will at once cause a rapid change in the color of the paper from the original yellow to a bright pink. The test offers a simple diagnostic measure for the confirmation of suspected bromide intoxication. It is not vitiated by the presence of chlorine or iodine.

In slides of the brains of animals poisoned with bromides subcutaneously and by the mouth, Gärtner (Zeit. f. d. ges. exp. Med., June 30, 1926) found a localization of the bromide on the protoplasmic glia. He explains the sedative action of bromides as a dehydration of the membranes which increases their permeability and results in a decrease of irritability. Large amounts of bromide subcutaneously, like hypertonic salt solutions, caused marked changes in Nissl's bodies throughout the cerebrum. In addition, the endothelial cells showed vacuolation and the nerve tissue marked degeneration.

**POISONING.**—Ingested bromide passes with difficulty through the kidney epithelium, according to U. J. Wile (Jour. Amer. Med. Assoc., July 30, 1927). The accumulating bromide displaces the chloride



ion in the body, a chloride deficiency resulting. Observations in 8 cases demonstrated the great value of **physiologic salt solution intravenously** in bromide poisoning, both the mental and skin symptoms undergoing rapid involution. The liberation of bromide from the tissues occasionally causes a sharp renal irritation. The initial dose of salt solution should not exceed 100 to 150 c.c. ( $3\frac{1}{2}$  to 5 ounces). If well borne, this may be increased to 300 to 400 c.c. (10 to  $13\frac{1}{2}$  ounces), given twice a week. The utility of Belote's test for bromine in doubtful cases of bromism was confirmed by the writer; it proved particularly useful in cases of toxic bromide psychosis without skin eruption, such cases, on being correctly diagnosed, clearing up promptly under intravenous salt solution. Stryker (Jour. Mo. State Med. Assoc., Jan., 1928) reports 2 cases of bromism in which prompt recovery followed intravenous injection of normal salt solution.

**THERAPEUTICS.**—O. Wuth (*ibid.*, June 25, 1927) maintains that rational treatment with bromides should be based on the existing relationship between the chlorides and bromides in the body, *i.e.*, on the chloride-bromide equilibrium. Bromide dosage is indefinite unless the chloride intake and bromide saturation are known. To ascertain the latter he uses a "comparator" with tubes containing dyestuffs, with which the test result in any given case is to be compared. In making a test, 10 c.c. of blood is drawn from the patient's vein and allowed to clot. To 2 c.c. of the serum are added 4 c.c. of distilled water and 1.2 c.c. of 20 per cent. trichloroacetic acid. After standing  $\frac{1}{2}$  hour the mixture is filtered through a small filter. To each c.c. of clear filtrate is added 0.2 c.c. of 0.5 per cent. gold chloride, after which a comparison with the color tubes in the comparator is made. On the color tubes are figures indicating the milligrams of sodium bromide per 100 c.c. of blood serum.

In prolonged bromide treatment, the chloride balance in the urine should, if possible, be determined beforehand. Estimation of the urine chlorides will show whether the patient habitually takes 5 or 10 Gm. of salt daily. If it is 5, bromide dosage should not exceed 2 Gm. (30 grains) a day, lest intoxication develop

within about 20 days; if it is 10 or more, 2 Gm. of bromide a day will probably be inadequate. In the average patient, it is well not to exceed 0.125 Gm. (2 grains) of sodium bromide per 100 c.c. of serum. In some epileptics, however, such factors as menstruation, unavoidable periods of overwork and excitement or dietary changes of salt balance tend to increase the frequency of convulsions; 0.125 Gm. may under these circumstances be exceeded. Above 0.15 Gm., there is liability to toxic symptoms. In **epilepsy**, to guard against the effect of any sudden increase of salt intake and eliminate the risk of status epilepticus, it is well to keep the patient slightly above the lowest bromide level at which his convulsions disappeared. Where, in severe cases, convulsions are not controlled by bromides up to 0.17 to 0.2 Gm. per 100 c.c. of serum, it is useless to try to push bromide therapy.

Sodium bromide acts well, in the experience of F. F. Martinez (Paris méd., Aug. 28, 1926), in reducing gastric motility and secretion, as in **gastric ulcer** and **hyperchlorhydria**. It is also very effective in **pylorospasm**. The daily dosage is 30 to 45 grains (2 to 3 Gm.), or even occasionally 60 grains (4 Gm.).

In **hay fever** F. Hamburger (Münch. med. Woch., Nov. 23, 1927) deems bromides serviceable. After 1 to 3 days of bromide treatment the symptoms frequently subside. He gives either 15 grains (1 Gm.) of sodium bromide or 1 sedobrol tablet twice daily  $\frac{1}{2}$  hour before the patient leaves the house. The patient should preferably stay in bed or in the house with the windows shut for 1 week.

**BRONCHI.**—The *bronchial breath sounds*, according to G. Fahr (Arch. of Int. Med., Feb., 1927), are almost entirely obliterated by friction when the tubes of an internal diameter of about 2 mm. are reached. Bronchi with an internal diameter of 3 mm. are 3 cm. ( $1\frac{1}{5}$  inches) from the pleural surface in the upper lobes and 3.5 to 5 cm. ( $1\frac{2}{5}$  to 2 inches) in the lower lobes, except near the vertebral column, where they are only 1 to 2

cm. ( $\frac{2}{5}$  to  $\frac{4}{5}$  inch) from the periphery. Consolidation must reach inward this far in order to make good conducting contact with bronchial tubes of 3 mm. bore and thus conduct bronchial breath sounds to the wall of the thorax in *pneumonia*. The 1st auscultatory signs of pneumonia are crepitant râles, diminished or absent breath sounds, and diminished spoken voice. Tactile fremitus is also diminished at a time when the consolidation has not reached bronchi of 3 mm. internal diameter. When these bronchi are surrounded by consolidation reaching to the periphery, bronchial breathing, bronchophony and a stronger fremitus appear. Pectoriloquy appears when the consolidation reaches in to around bronchi of 5 to 6 mm. internal diameter. The spoken vowel sound over normal lung contains only the fundamental frequency of the vowel sound. Pectoriloquy is obtained when the vowel sound is so well conducted to the chest wall that the sound contains the formatives as well as the fundamental frequency. In bronchophony the fundamental frequency is better transmitted to the periphery and thus louder, but the formatives are not well transmitted, and therefore the vowel is not distinct, but only louder than when heard over normal lung.

**FOREIGN BODIES.**—Reporting 11 cases of foreign bodies in the bronchiotracheal tree in which spontaneous recovery occurred, without bronchoscopy, L. H. Clerf (*Laryngosc.*, Mar., 1926) states that the chances of such spontaneous expulsion with recovery of the patient are at best not more than 3 per cent. So long as the foreign body remains there is a progressive increase in the

pathologic processes; danger of complications; an increase in the difficulties attending the removal of the foreign body, and in certain cases the ever-present danger of asphyxiation. Careful bronchoscopy gives over 98 per cent. of successful removal with recovery. Under such conditions, no well-informed person would advise waiting in the vain hope that the intruder will be spontaneously coughed up.

The difficulties met with in the removal of *beads* from the bronchi, and their solution, are described by E. J. Patterson (*Ann. of Otol., Rhin. and Laryng.*, Dec., 1926). To get a secure grasp of a bead, the forceps blades must be applied beyond its equator. The forceps correctly constructed to grasp a bead must have the planes of the grasping forceps parallel instead of divergent, otherwise the grasp is insufficient and the bead will be stripped out of the forceps. It is better for the distal ends to bend slightly toward each other. Serrations in the cups are essential. The Tucker bead forceps fulfills these requirements. In a clinical case, study of the presentation of the bead from the radiograms and endoscopically is important. G. Tucker (*ibid.*, Mar., 1927), describing the forceps advocated, notes that the forceps are provided with a stiff, expanding spring which enables the blades to repress the bronchial mucous membrane and find their way between the bead and the bronchial wall. The forceps are made in 2 sizes, the smaller to go through a 4-mm. bronchoscope.

Another device for the same purpose has been described by S. Jesberg (*Laryngosc.*, Dec., 1926). It consists of a steel stylet or probe, con-

taining at its distal end an eye through which a thin rubber band can be stretched. The probe with the stretched rubber band is made of such size as will just pass through the hole in the bead. This having been accomplished, the tension on the rubber band is released; the expansion of the rubber band locks the bead on the stylet, which is then withdrawn.

That foreign bodies in the bronchus may occasionally be of *intrapulmonary origin* is emphasized by P. P. Vinson (Surg., Gyn. and Obst., Oct., 1927). In rare instances 1 or more calcified hilar lymph-nodes ulcerate into the bronchus. This may give rise to all of the symptoms produced by any foreign body aspirated through the mouth. In an obscure case of multilocular empyema, sudden inability to bring up pulmonary secretion led to a bronchoscopic examination, which revealed 3 pieces of calcareous material in a strictured bronchus. Death later occurred from the empyema, and 2 additional large calcareous deposits were found lying free in the bronchial lumen. If the empyema had not resulted fatally, repeated dilatations of the bronchial stricture would, it was believed, have permitted **removal** of the foreign bodies with restoration of the patient to normal health.

**TUMORS.**—T. McCrae, E. H. Funk and Chevalier Jackson (Jour. Amer. Med. Assoc., Oct. 1, 1927) deem *carcinoma* of the bronchus much commoner than is generally thought. Among 53 instances of carcinoma observed in 621 autopsies, 4, or nearly 8 per cent., were primary in the bronchi. The diagnosis is made by bronchoscopy. The tumor may be

sessile or pedunculated, nodular or ulcerated.

Sometimes the tumor has a distinctive color—white, yellow, red, purple, or various shades of these colors. At other times it is of the same color as the normal mucosa, and changes in form and movement alone reveal the abnormality. The tumors distort the normal thin, white spurs between branch bronchi, the oval or circular orifices, and the circular walls. The bronchial rings proximal to the tumor may be obliterated and the mucosa folded into longitudinal ridges. The bronchi show a wooden, cadaveric fixity, most manifest in the immobility of the carina. The pulsations transmitted from the heart are not visible. Fixity due to inflammation, tuberculous adenopathy or fibrotic conditions is not as marked as that due to cancer. The absence of inspiratory expansion and elongation, of expiratory contraction and shortening, and of kinking and deflection, in cancer of the lung is of weighty diagnostic import. Tumors with broken surface must be differentiated from granulation tissue.

If **deep X-ray** therapy is contemplated, the diagnosis by bronchoscopic appearance alone is usually sufficient, while if **external surgery** is contemplated biopsy through the bronchoscope is indicated. Biopsy is safe in endobronchial tumors, but not advisable through normal mucosa into peribronchial tissues. Pulmonary tuberculosis and active syphilis usually contraindicate biopsy; at least, their presence should be known before the procedure. One must look out for aneurisms. Only in very rare cases is **bronchoscopic removal** of the carcinoma feasible.

**BRONCHIECTASIS. — SYMPTOMS.**—Regarding bronchiectasis in children, Leonard Findlay (Glasgow Med. Jour., Sept., 1927) agrees with DeLille that there are 3 types of cases: (a) Cases with typical signs and symptoms; (b) cases with suggestive symptoms but no bronchiectasis; (c) cases of bronchiectasis with neither signs nor symptoms. Not only for diagnosis of the presence of bronchiectasis but also for correct information as to its extent, introduction of lipiodol is essential. Among 25 cases of verified bronchiectasis in children, the patients were as a rule undersized, but usually well-nourished. Clubbing of the fingers was present in 11 cases, and was related more to the extent of the disease than to its duration. Cough was present in 24, and sputum in 17. In all of the cases in which sputum was absent the disease was of less than 18 months' duration. In only 3 cases was the sputum fetid. Amphoric breathing was audible in 10, and whispered pectoriloquy in 7. In 16 cases the left lung alone was involved, in 4 the right lung alone, and in 5 both lungs. In no case was the apex alone the seat of the disease. In all but 3 cases the condition could be traced to some acute pulmonary disease; in the 3 exceptions the disease set in insidiously. In the autopsied cases both chronic pneumonia and pleural adhesions were invariably present.

**ETIOLOGY.**—Bronchiectasis associated with disease of the *nasal accessory sinuses* is emphasized by L. H. Clerf (Arch. of Otolar., July, 1927). Examination of a patient complaining of chronic cough, with or without expectoration, is never complete

until a careful study of the accessory sinuses has been carried out. The unfavorable effect of chronic sinusitis on the bronchial infection in chronic bronchitis suggests a similar influence in bronchiectasis. In chronic cough or questionable bronchiectasis, diagnostic bronchoscopic and pneumographic studies are indicated.

The connection of bronchiectasis with chronic nasal sinusitis is recognized also by J. Adam (Glasgow Med. Jour., Sept., 1927). In his experience, in some cases it is difficult to say whether the symptoms of sinusitis or those of bronchiectasis were prior, but in the majority the sinusitis preceded. In every case where sinusitis was the cause the antrum, with or without other sinuses, was affected. The nasal pus is apt to enter the bronchi during sleep. The nexus is apt to be missed, as both conditions cause cough and fetid discharge, and the examiner, having found 1 source for this, is apt to miss the other. Clubbed fingers and fetid expectoration on inversion of the patient will usually prove bronchiectasis. Absence of both almost negatives it, especially in a chronic case. Flow of pus into the nose on stooping of the head usually means sinusitis; its absence does not negative sinusitis. It is to be remembered, however, that in bronchiectasis with profuse pus inversion may cause pus to flow through the nose. The lung condition due to sinusitis is rather a *bronchiolectasis* than a bronchiectasis, as the X-ray shows. The cavities are apt to be numerous rather than appear as 1 or 2 distinct cavities as occurs in the cases of foreign body. Cavities arising from sinusitis tend to be tubular or racemose rather than



saccular. The bronchiectasis is almost always confined to or greater in the right lung, as one should expect if caused by inhaled pus. Proving the absence of sinusitis in a case of bronchiectasis may require repeated examinations, sometimes over a period of weeks. In suspected phthisis with purulent sputum, where the tubercle bacillus is not found, the bronchi and nasal sinuses should be investigated by X-ray and otherwise; likewise in post-pneumonic bronchiectasis. The writer reports 13 cases illustrating the connection of bronchiectasis with the sinuses. In 1 case, when the antrum was washed through, the fluid at 1st returned clear, but after 2 minutes an ounce of thick, malodorous, pultaceous matter came away. Obviously this was dried-up pus, and a sinusitis had existed for many years and been missed by various observers—the patient having had nasal polypi removed several times in the preceding 40 years. Three of the 13 cases ultimately died of brain abscess.

Sauerbruch (51 Tag. d. deut. Ges. f. Chir., 1927; Int. Abst. of Surg., Nov., 1927) maintains that the majority of cases of bronchiectasis are due to *congenital cystic dilatations* of the bronchial tree. This is evidenced in that 80 per cent. of bronchiectases are found in the left lower lobe; that there is no evidence of inflammatory disease in the exposed lower lobe; that even on gross inspection pathologic changes are seen in the bronchial tree but not in the pulmonary tissue, and that the history usually includes catarrhal conditions in childhood, and a pneumonic disease is not demonstrable. The frequent occurrence of bronchiectasis in the left lower lobe may be explained embryologically. Persons with congenital bronchial cysts may not be very ill. Only the occurrence of in-

fection leads to chronic disease. In the chronic stage a cure can be obtained only by **resection of the lower lobe.**

**DIAGNOSIS.**—The diagnosis of bronchiectasis by contrast medium roentgenography has been receiving widespread endorsement. According to C. A. Hedblom (Trans. Amer. Med. Assoc., May, 1927), iodized oil bronchography not only establishes the diagnosis of bronchiectasis, but makes possible the certain recognition of unilateral and bilateral involvement and of the type and localization of the disease. By its use bronchiectasis may be diagnosed in its incipency, when it responds most favorably to treatment. J. Adam (*loc. cit.*) uses only *lipiodol* for the purpose, and injects always through the glottis. This is easily done with a 20-c.c. syringe; if by indirect laryngoscopy, the syringe has a long curved metal tip which is passed between the vocal cords; if by direct laryngoscopy, a gum elastic catheter fixed to the nozzle of the syringe is passed well into the trachea. He prefers the latter method. In either case the patient is in the sitting posture. Previous cocaineization of the cords makes introduction easier and also diminishes cough—an important point, for otherwise much of the *lipiodol* is apt to be coughed up and the value of the picture diminished. If one uses a 3 per cent. solution of **cocaine hydrochloride** with 0.4 per cent. of **potassium sulphate** and a little **adrenalin** there is little risk of cocaine poisoning. The X-ray exposure is made within 5 minutes. [See also BRONCHOGRAPHY.]

**TREATMENT.**—The **thirst cure** is advocated by L. Guillemot and P.

Michaux (Bull Soc. de péd., Mar.-May, 1927) in the treatment of bronchiectasis in children. In a pronounced case in a girl of 16 years, with profuse malodorous expectoration, occasional hemoptysis, clubbed fingers, anorexia, vesperal fever and marked decline of general health, the patient, who had been taking considerable liquid food, was placed on a **dry diet**, with the fluids taken daily reduced to 500 c.c. Cream, meat, thick soup, eggs and pastry were allowed, but no salads or green vegetables. The urinary output dropped to 150 c.c., later rising to 750 c.c. Synchronously the purulent bronchorrhea dropped in a week from 500 to 100 c.c., then 75 and 50 c.c., and on the 30th day, to 25 c.c. Coughing spells were less frequent and severe, appetite returned, the fever declined, the patient slept better, and the odor of the sputum diminished. The auscultatory signs were improved, and the patient gained over 22 pounds. The dry diet was kept up. While the bronchiectasis remained, the effect on the suppurative process had been most gratifying.

**Intratracheal injections of "iodoform mud"** are advocated by G. Rosenthal (Paris méd., Feb. 11, 1928). A cannula is 1st introduced into the air-tract at the 1st ring of the trachea and 22 c.c. (5½ drams) of **balsam oil** introduced, causing a coughing spell which clears out the bronchi. Anesthesia of the pharynx and glottis having been instituted, an anesthetizing injection is made into the trachea, and after an interval of 10 minutes the "iodoform mud" is introduced. The mud consists of iodoform suspensions of 25 or 50 per cent. strength. Being opaque to the

X-rays, it subserves diagnostic as well as therapeutic purposes.

Where sinusitis is the cause of bronchiectasis, Adam (*loc. cit.*) treats the former surgically from the outset. Treatment of the lung should be begun at the same time with the bronchoscope and **bihourly inversion**. **Bronchoscopic suction** without regular inversion is of little use, though always worth while at the outset. Lavage of the lung may not benefit, as one is dealing with bronchioles and numerous small cavities which no tube can reach. Regular, punctual inversion will do more than any other treatment, provided the sinusitis has been cured. Septic tonsils and teeth must be dealt with. In post-pneumonic bronchiectasis **bronchoscopic treatment** may be invaluable.

Describing a method of instituting **postural drainage**, N. Neild (Brit. Med. Jour., Sept. 19, 1925) registers a preference for the lateral inverted position, for with the patient face down expansion of the lungs is hindered, while dorsal decubitus causes secretions to collect in the nasopharynx. With the patient, *e.g.*, on his right side, with the hip and knee joints somewhat flexed, pillows and cushions are packed under him to build a firm double-inclined plane under the shoulder, chest, waist and thighs. The highest point of the double-inclined plane should be under the lowest ribs. The patient's head lies on the right ear, with the mouth just beyond the edge of the bed. The point of the shoulder rests on the lower end of the inclined plane and the corner of a pillow tucked under the neck from behind. Pillows are now adjusted behind the scapulæ to maintain the forward or backward

addition to the lateral posture. If the elevation proves insufficient for drainage, the foot of the bed must be raised. Aside from bronchiectasis, the writer recommends such postural treatment in profuse *hemoptysis*; *pharyngeal palsies* such as occur in diphtheria; *paralysis of the diaphragm*; *inability to cough efficiently*, and *acute bulbar palsy* due to syphilitic endarteritis.

In a case of bronchiectasis and gangrenous cavity with extreme *fetor of the sputum*, Castex, Heidenreich and Repetto (Bull. de l'Acad. de méd., Feb. 9, 1926), after having little success from *neoarsphenamin* given intravenously along with balsams by the mouth, tried *intratracheal injections* of the arsenical in doses of 0.3 to 0.9 Gm. in an aqueous solution to which glycerin was sometimes added. The injections were given by the intercrico-thyroid route, preceded by *procaine* solution. The 1st injection caused the fetor to disappear for 10 days, with absence of Vincent bacilli from the sputum. Five injections in all were given at intervals of 1 to 2 weeks.

Where non-operative measures fail, **surgical treatment** of bronchiectasis is sometimes being given consideration. The procedure to be adopted, as noted by C. Riviere (Lancet, Nov. 27, 1926), depends upon the type of case. Thus, **pneumotomy** is suitable for single large suppurating cavities and for little else. **Exeresis of the phrenic nerve** may partly eliminate, and assist drainage in, a strictly basal lesion and is indicated for such. **Artificial pneumothorax** and **thoracoplasty** should be reserved for unilateral cases in which the lung and the cavities seem likely to be collapsible. **Lobectomy** and **cautery lobectomy** can only be considered for well-localized areas of disease.

According to W. Whittemore (Ann. of Surg., Aug., 1927), all surgical methods other than radical removal are only palliative. Where more than 1 lobe of the lung is involved, a **graded thoracoplasty** is the best procedure, but when the disease is limited to 1 lobe this is only palliative. Amputation of a lobe within the pleural cavity has a high mortality (5 deaths out of 6 in the writer's experience). When a limited amount of lung is to be removed, **cautery lobectomy** is best. The writer opens the pleura and examines the diseased lobe. If adhesions are firm or extensive, lobectomy may be unwise. If lobectomy is decided on, he removes sections of enough ribs to permit delivery of the diseased part of the lobe from the pleural cavity after division of the adhesions and the pulmonary ligament. The lung is then firmly sutured to the muscles of the chest wall, a large gauze sponge placed beneath the lobe to aid in holding it, and a No. 20 French catheter inserted to the root of the lung to collect the pleural secretion. The wound is then closed as tightly as possible. The operation causes very little shock. In about 10 days the lobe becomes necrotic, dry gangrene is established, and after 4 or 5 weeks the whole area sloughs off, leaving a clean granulating surface with bronchial fistulas. In 2 out of 5 cases thus dealt with in which a complete recovery resulted the fistulas closed spontaneously. By this method lobectomy can be completed in 1 stage without excessive danger.

Zaaijer (Deut. Zeit. f. Chir., Mar., 1927) advocates the following sequence of operations in lower lobe bronchiectasis. After any 1 of them cure may

result, and each 1 lessens the danger of the next: 1. **Exeresis of the phrenic nerve.** 2. Extensive rib resection over the disease focus, with removal of the periosteum and intercostal musculature (**thoracoplasty**). 3. **Intrathoracic isolation** of the diseased lobe by tamponade. 4. Incision and **resection** or **extirpation** of the diseased lobe. In a case reported, the 3d operation resulted in complete clinical cure, with the lower lobe shown by the X-ray to be wholly obliterated.

**BRONCHITIS. —ACUTE.**—In acute bronchitis or pneumonia *in children*, as stated by L. B. Cole (Lancet, Oct. 15, 1927), it is important to keep the mouth as clean as possible. A septic throat, suppurating middle ear, or purulent nasal discharge is often traceable to neglect of this precaution. A weak antiseptic mouth-wash of **phenol** or **potassium permanganate** should be used for this purpose. The nasal passages should be kept as clear as possible by encouraging the child to blow the nose. When this is not effective, the anterior nares may be cleared with cotton pledgets and irrigated with warm **boric acid** and **sodium bicarbonate** solution—1 dram (4 Gm.) of each to 1 pint (500 c.c.)—with a syringe. This should not be done, however, unless the obstruction is definitely distressing the child. As an initial purge, **gray powder** is suitable for children under 3 years, and **calomel** followed by salts for older ones. Later, **syrup of senna** or **cascara** is appropriate. Rapidity of convalescence depends on the type and severity of the attack. After an acute bronchitis of the larger tubes or mild lobar pneumonia,

a child of 3 may be allowed to walk about the cot 2 or 3 days after the temperature is normal. A child of 12 should stay in bed 10 days after mild lobar pneumonia. After bronchopneumonia convalescence is much slower.

**CHRONIC.**—Cases of chronic bronchitis are divided by E. O. Otis (Boston Med. and Surg. Jour., May 14, 1925) into (a) those due to some specific organism and (b) those resulting from frequent repetition of an ordinary tracheobronchitis. The latter group includes the cases often found in elderly persons with degenerative changes and those constantly exposed to dampness. Various dusts and irritant vapors are also factors. The bacteriology of this 2d group shows no predominant organism. Other conditions in which the leading or prominent symptom may be chronic bronchitis are: Intrathoracic tumors with no localizing signs; foreign bodies; pneumokoniosis; chronic empyema; aortic aneurism, and arthritic conditions or gout. Careful study will generally reveal the true cause. Sputum examination to rule out tuberculosis is always essential. The treatment is based on removal of the cause, if possible; if not, **change of climate** is often successful.

Among 196 cases of **chronic non-tuberculous bronchitis**, F. B. Kistner (Northw. Med., Apr., 1927) was able to demonstrate *chronic accessory nasal sinus disease* in all but 6; 164 cases had had their sinuses operated on or been treated long enough to permit of judging the effect of the sinus treatment on the bronchitis. Three classes of cases may be recognized: (1) Cases with slight chronic catar-



rhial discharge from the nose and nasopharynx and an irritative cough, and occasional expectoration with slight variable signs, especially clusters of moist râles in the base of 1 or both lungs. (2) Cases with frequent exacerbations of a latent sinus disease, followed by acute diffuse bronchitis going on to the chronic stage. (3) Cases with definite purulent discharge from the nose, perhaps with odor and the picture of bronchiectasis. Where the bronchial infection is in an incipient stage, cure of the sinus, removing the source of bronchial reinfection, will often result in complete recovery. The results of treatment in the 164 cases alluded to were uniformly good. A number of cases were cured by conservative treatment, such as **antrum lavage**, especially in children, but the great majority had 1 or more **operations on the sinuses**, and the best and most rapid results followed radical surgery.

A. Castellani (New Orl. Med. and Surg. Jour., July, 1926) urges that the hemorrhagic bronchitis of protozoal, helminthic or fungal origin deserves more attention than has hitherto been given it. All these cases are generally mistaken for tuberculosis, but while pulmonary tuberculosis in the hemorrhagic stage is often incurable, most of the protozoan conditions are amenable to treatment if the correct diagnosis is made in time.

**TREATMENT.**—In treating 30 cases of chronic bronchitis, G. P. Grabfield (Boston Med. and Surg. Jour., Nov. 24, 1927) made an analysis of the symptom-complex and course of this disorder. The average duration of the bronchitis before treatment had been 11 years and the average age when seen was 50. In 11 the onset

had been insidious, in 14 dated from a cold, in 4 from long-standing asthma, and in 1 from measles. Four complained constantly of pain in the chest and the same number had at times a blood-streaked sputum. The physical signs varied greatly, even in the same patient. Relative dullness was found at the apices in 13 cases; in 7 of these, the X-rays showed cloudiness over the dull apex. The dullness was often accompanied by localized râles and slight changes in breath sounds. The râles tended to be of the coarser and musical types. A third of the cases showed no râles at any time. Tuberculosis was always carefully excluded. Only 4 patients associated a loss of weight with their cough.

In treatment, the action of **sputum vaccines** is admittedly variable in most hands. In 22 cases the writer tried out the drug known as **eucupin**, chemically iso-amylhydrocupreine. The doses ranged from 0.05 to 0.2 Gm. ( $\frac{3}{4}$  to 3 grains) 3 times a day, after meals. The reason for trying out the drug was that it is said to possess specific streptococcicidal properties and that chronic bronchitis is looked upon by many as a chronic streptococcal infection. Ten patients were improved, including 2 apparently cured; in 5 improvement was doubtful, and 7 were not improved. In some of the cases startling improvement seemed to follow immediately the giving of the drug. In subsequent experience **quinine bisulphate** seemed just as effective as eucupin, and the writer endorses its use in doses of 5 grains (0.3 Gm.) 3 times a day.

In view of the statement that all such chronic coughs are due to car-

diac insufficiency, 10 cases were selected at random and given **digitalis**. Two were improved, and these 2 were the only ones showing slight cardiac enlargement on percussion.

Almost all the patients had foci of infection, some of which were removed. In 2 cases improvement seemed to follow **removal of infected teeth or tonsils**.

According to H. Koller-Aeby (Schweiz. med. Woch., Aug. 7, 1926), **ether** by the mouth is of distinct value in bronchitis. He gives it with an equal amount of **turpentine**, 10 drops of the mixture being taken in water 3 times daily after meals. In chronic bronchitis, with or without asthma, it is frequently of value.

Cases of chronic bronchitis and *emphysema* were found by E. P. Poulton and J. M. H. Campbell (Quart. Jour. of Med., Jan., 1927) to benefit from residence for 1 to 3 weeks in a chamber containing about 40 per cent. of **oxygen**. Cough, sputum and dyspnea were reduced, rhonchi disappeared, and appetite and body weight increased. In some patients the effects seemed at least partly maintained for months after the treatment; in others they soon wore off. The treatment caused an increase in the percentage of CO<sub>2</sub> in the expired air during both rest and exercise. In bronchitis without bronchospasm, the clinical improvement from oxygen seemed to be attended with a diminished intake of oxygen during exercise.

On the basis of observations in 68 cases, W. F. Enklaar (Ned. Tijds. v. Gen., Apr. 17, 1926) sees manifest advantage in giving a **polyvalent vaccine** in chronic bronchitis. Excluding 13 patients in whom diseased tonsils and adenoids were removed,

80 per cent. showed marked benefit from the procedure. The vaccine is injected intramuscularly at weekly intervals. Autogenous vaccines were used at 1st, but the difficulty of obtaining sputum from children led the writer eventually to mix the vaccines from old and young patients.

The **bronchoscope** was found of great value by J. P. De River (Med. Jour and Rec., Feb. 3, 1926) in *chronic tracheobronchitis* after other measures had failed. Many cases may be benefited by it plus medical treatment, including **vaccines**. Among 28 cases treated, the bronchitis in many followed inhalation of *mustard gas* or *phosgene*. In these the entire tract, from the larynx down, shows bronchoscopically a beefy red, injected appearance. The tracheal rings stand out intensely white, and there is usually a profuse mucoid exudate, with scattered areas of scar tissue. In the other cases, due to *influenza*, the mucosa was bluish gray, with areas of old fibrosis. The bronchial lumina were generally reduced, apparently from edema. Secretions were profuse and mucopurulent, and there seemed to be a loss of muscular tone, together with impaired ciliary action. In such cases much benefit accrues from **bronchoscopic drainage** and local applications of a solution stimulating the mucosa and causing shrinkage of the smaller bronchi. **Aspiration** removes the excessive secretions. Along with the bronchoscopic treatment, **rest, climate, hygiene, diet, vaccine and elimination of foci of infection** should be availed of.

According to H. H. Perlman (Arch. of Phys. Ther., Mar., 1928), the **ultra-violet rays** are of distinct service in chronic bronchitis *in children*,

in particular in the types of cases ordinarily not benefited by drug treatment. Non-tuberculous bronchitis is far more amenable to these rays than tuberculous bronchitis.

Gerber (Jour. Amer. Med. Assoc., Oct. 3, 1925) has advised the use of the **X-rays** in chronic bronchitis. His best results were obtained in the younger patients, especially in children who had persistent coughs after an attack of gripe or whooping-cough.

In a case of *putrid bronchitis* seen by Litzner (Münch. med. Woch., Apr. 1, 1927), recovery followed the administration of 6 injections of **neoarsphenamin** at intervals of 10 to 14 days.

**BRONCHOGRAPHY.**—This procedure, now rather widely utilized, consists in the introduction of a substance opaque to the X-rays, usually the iodized oil, lipiodol, into the lower respiratory tract for purposes of X-ray demonstration of the bronchi and their ramifications, together with adventitious cavities or recesses. As noted by J. J. Singer (Arch. of Surg., Jan., 1927), 5 methods are available: (1) Injection through the cricothyroid membrane; (2) intratracheal injection by way of the larynx; (3) injection through the bronchoscope; (4) intratracheal introduction of the oil by indirect illumination of the larynx, and (5) injection into the pharynx during a deep inspiration. The 1st method is recommended by the writer for children, the 4th and 5th for adults, and the 2d and 3d when bronchoscopy is performed for other purposes. The 5th method should be tried in adults before the more complicated ones are attempted. If

it is unsuccessful, the 4th is the method of choice.

The *indications* for bronchography with lipiodol are enumerated by S. Pritchard, B. Whyte and J. K. M. Gordon (Radiol., Feb., 1927) thus: (1) Chronic cough with long-standing infection in the upper respiratory tract, particularly sinusitis. (2) Cough with purulent expectoration giving the history of a previous pneumonia or the inspiration of an organic foreign body. (3) Long-standing cough with little, if any, expectoration in the absence of frank pulmonary disease. (4) Obvious cases of bronchiectasis, to map the diseased area. (5) Bronchial fistulas. (6) As a therapeutic agent.

The *supraglottic method*, which consists in allowing the warmed oil to flow through the open glottis into the trachea, without introduction of a cannula into the larynx, is favored by Pritchard (Jour.-Lancet, Nov. 15, 1926) because it is simpler than the others, saves time, causes less strain and worry to the patient, does not require a trained specialist, is easily learned, requires less anesthesia, and causes no throat soreness or tenderness over the trachea. Any part of the bronchial tree can be visualized by this method in most instances.

The iodized oil liberates metallic iodine in the intestine. If, in the supraglottic method, fluoroscopy shows that any considerable amount of it has been swallowed, a glass of hot water containing 1 dram (4 Gm.) of **sodium bicarbonate** will often cause emesis and prevent the oil from entering the intestine. If it does, **castor oil** will expel it before it breaks down. Six instances of mild iodism out of 1000 cases are thought to have been

the result of unnoticed oil in the gastro-intestinal tract. (Pritchard, Whyte and Gordon.)

The use of a special *double-barrelled intubation tube*, with a main channel for breathing and a secondary channel for the oil, provides a simple and effective method for *endotracheal injection*, according to S. Iglauer (Jour. Amer. Med. Assoc., June 19, 1926). This method may be used in both children and adults. The writer has used the procedure in the study of the stenotic larynx, distortion and displacement of the trachea and bronchi, lung abscess, cavitation, pulmonary tumors, and bronchopulmonary fistulas. Occasionally, some fever and dyspnea ensued. Iodized oil injection is contraindicated in febrile and cachectic states and in cardiac decompensation. The writer has used it in tuberculosis, which some others have regarded as a contraindication.

According to D. H. Ballou (Arch. of Otolaryng., May, 1926), the *bronchoscopic method* of injecting lipiodol is safer and more satisfactory than any other, having the added diagnostic advantage of observation by direct vision of the actual condition in the bronchi and lungs. The quantity of lipiodol injected ranges from 10 to 40 c.c. True lung abscess which remains partly or wholly unfilled is readily differentiated from a bronchiectatic abscess or a tuberculous cavity which fills readily. Bronchiectasis is diagnosed at a glance. In pulmonary tuberculosis, cavities are localized; the presence and extent of associated bronchiectasis and normal lung are demonstrated. Bronchial new growth must be diagnosed bronchoscopically; lipiodol is only an

aid. Bronchial fistulas and empyema cavities are clearly defined.

In *children*, S. Graham (Glasgow Med. Jour., Sept., 1927) prefers the *subglottic method*, under general anesthesia. The needle to be passed through the cricothyroid membrane should preferably be curved and mounted with a flange like a tracheotomy tube. As lipiodol is very viscous, it should be warmed to body temperature; a device whereby the piston can be screwed home is convenient. Before starting the anesthetic, the bronchiectatic cavities should always be emptied as completely as possible by inverting the child and inducing him to cough. The needle is inserted through the membrane downward and backward. Its entrance into the lumen should be verified by the free in-and-out movement of air possible when a syringe is connected with the needle. **Procaine**, 8 minims (0.5 c.c.) of a 4 per cent. solution, having been introduced to lessen the tendency to cough, the lipiodol is slowly injected. Entrance of the oil may be aided by elevating the shoulders slightly during the injection. It is not necessary to turn the child on his side to facilitate the flow into 1 or the other lung, as the bronchiectatic portions seem to have an affinity for the oil. An X-ray picture is taken as soon as the injection is completed. An important point is to inject enough lipiodol; at least 18 c.c. is required, and often better results are obtained with 36 c.c. As a rule, some of the oil is coughed up and swallowed, and will be seen in the stomach.

H. P. Mosher (Laryngosc., Feb., 1927) calls attention to a drawback connected with the use of lipiodol,



*viz.*, that the saturation of a given area of normal lung with it will give the X-ray picture of a lung abscess. So many apparent lung abscesses were being observed at the Massachusetts General Hospital that the suspicion arose that certain shadows represented merely lung "drowned" in lipiodol. Experiments on dogs verified this suspicion. To avoid drawing false conclusions, solutions of lipiodol weaker than 40 per cent. must be used. Experiments looking to the introduction of the oil with a nebulizer have been undertaken.

### BRONCHOPNEUMONIA.—

**ETIOLOGY.**—In *streptococcic* bronchopneumonia, according to A. Dufourt and Sédallian (Lyon méd., Aug. 28, 1927), a large focus of disease in the apex 1st appears. Fine râles and impaired resonance or dullness are elicited in the supraspinous and infraspinous fossæ and below the clavicle. In 3 or 4 days the physical signs appear in the middle of the lung; then the base becomes involved. This creeping process is a feature of streptococcus infection. A broken, irregular temperature curve is noted. Marked pallor is present, owing to the hemolytic effect of the organisms. Physical signs persist even after defervescence, and convalescence is slow. The writers confirm the diagnosis by lung puncture and culturing on blood-gelose. Recurrences of bronchopneumonia in the succeeding months suggest a streptococcal causation. In using **antistreptococcus serum** the writers continue large doses as long as fever or auscultatory signs persist, *e.g.*, 30 c.c. daily in children below 2 years and 40 to 60 c.c. above this age.

With the thought that the type of pneumococcus found in the throat early in pneumonia in children might

be a fairly reliable index of the type causing the infection, R. E. Westlund (Jour. of Inf. Dis., June, 1926) made a comparative study of the pneumococci present in the throat in pneumonias and in diseases other than pneumonia. Among 34 cases of bronchopneumonia and 69 of lobar pneumonia occurring in children between the ages of 3 weeks and 11 years, pneumococci were obtained by nasopharyngeal swabbing in 52.6 per cent. of the cases of bronchopneumonia and in 60.8 per cent. of those of lobar pneumonia. The relative incidence of pneumococcus types in the 2 groups was much the same, the order of frequency of the 4 types being IV, II, I and III. In 13 cases of non-pneumonic respiratory disease, pneumococci were present in 92 per cent., Type II and Group IV forming  $\frac{1}{3}$  and  $\frac{2}{3}$ , respectively, of the pneumococci isolated. In 48 cases of non-respiratory diseases, Type II made up 14.2 per cent.; Type III, 3.6 per cent., and Group IV, 82.1 per cent.

A case of *chronic bronchopneumonia* due to *congenital syphilis* is reported by S. I. de Jong and Lestocquoy (Presse méd., Feb. 20, 1926). The child, 9 months old, had fallen ill with an intermittent type of fever, very severe attacks of dyspnea, paroxysmal cough, and progressive cachexia. The clinical picture somewhat suggested asthma or stridor due to enlarged tracheo-bronchial glands. The tuberculin test ultimately became positive, but syphilis was diagnosed because of the rachitic appearance, enlarged peripheral lymph-nodes, and high cell count and albumin in the spinal fluid. The failure of specific treatment is ascribed to its late advent and to its lesser efficiency in congenital syphilis in general. Necropsy showed pulmonary lesions resembling those of

syphilitic white pneumonia, together with fibrosis of the lungs.

**PATHOLOGY.**—In a fatal case of bronchopneumonia in an infant  $3\frac{1}{2}$  months old in whom nervous symptoms had been very violent, C. de Lange (Jahrb. f. Kind., Feb., 1928) made a detailed pathologic study of the brain. There had been severe spasms and marked hypertonus, with the legs drawn up toward the trunk. Bilateral bronchopneumonia was found at the necropsy. The lower portion of the brain showed slight hyperemia. In the pia-arachnoid the cell content was increased in places. Slight edema was present in the upper layer of the cerebral cortex. In the right gyrus centralis anterior, or leg-center, the vessels of the pia-arachnoid were engorged, and in places there were small accumulations of monocytes. The right and left cerebellar hemispheres had an external granular layer. The corpus striatum was remarkably poor in cells, though the glia were fairly normal. In the nucleus caudatus there was a slight increase in marginal glia. The glia cells of the putamen showed some karyokinetic figures. Various stages of cell destruction were observed.

The decrease in cells in the corpus striatum, due to toxic action, is believed to have accounted for the pronounced hypertonus and tremors in this case, the normal striatum being considered an inhibitory center for the corticospinal tract.

**DIAGNOSIS.**—The utilization of the *X-rays* for the exact diagnosis and pathologic study of pneumonia and other acute lung conditions is endorsed by L. G. Rigler (Minn. Med., Nov., 1926). The type, dis-

tribution and extent of pneumonia can be thus accurately determined. Attention is especially directed to a form of localized bronchopneumonia simulating early tuberculosis and to capillary pneumonia following measles. Serial X-ray studies will demonstrate extension of the pneumonic process and the various stages of resolution. Unresolved pneumonia and other residues can be determined definitely. The complications of pneumonia, especially empyema, can be diagnosed very early.

**TREATMENT.**—In treating bronchopneumonia and lobar pneumonia *in children*, as described by L. B. Cole (Lancet, Oct. 22, 1927), sleeplessness should be prevented from the start. In the early stages, and in many cases throughout, **potassium bromide** and **chloral hydrate** are best. **Tepid sponging** often assists. If these fail, 1 minim (0.06 c.c.) of **tincture of opium** or 1 grain (0.06 Gm.) of **Dover's powder** may be given. The dosage in each case must be judged with especial reference to the amount of respiratory distress. For pain in the chest, **antiphlogistine** or **methyl salicylate** ointment are the best local applications. In older children pain from a localized patch of pleurisy may be relieved by immobilization of the affected side with **adhesive strips**. For a tendency to cyanosis, or hindrance of easy respiration by secretion in the tubes,  $\frac{1}{100}$  grain (0.0006 Gm.) of **atropine** should be given hypodermically in a child of 3 years, 3 times daily or, in severe cases, 4-hourly. In weakly children, or those with abnormal rapidity or feebleness of the pulse, it is well to give a **stimulant** from the start. The following is a useful mixture:

R *Spts. ætheris*,  
*Spts. ammon arom.*,  
 āā ..... m̄v (0.3 c.c.);  
*Aquæ* ..... q. s. ad f3j (4 c.c.).—M.

The writer finds **brandy** a most valuable stimulant in severe cases. Thirty minims (2 c.c.) may be given 4-hourly to a child of 3 directly any tendency to cardiac weakness appears. The dose may be increased to 1 teaspoonful or more, if necessary. **Adrenalin** seems of value in some cases; 5 minims (0.3 c.c.) of the 1:1000 solution may be combined with injections of atropine. In sudden cardiac failure a small and isolated dose of **strychnine** is of value; it should only be repeated at long intervals. The writer has never observed benefit from digitalis. For collapsed children under 2 years a **mustard bath**, 1 heaping tablespoonful of mustard per gallon of hot water, is the most valuable stimulant. In certain cases of severe lobar pneumonia and bronchopneumonia with cyanosis and much respiratory distress, removal to the **open air** causes immediate and marked improvement. If a spot well sheltered from the wind and rain is obtainable in a garden or on a balcony and the child is in the hands of an efficient nurse, the treatment is very valuable; otherwise it is better avoided. For patients with cyanosis, **oxygen** is useful when given for 15 minutes in every hour through a catheter introduced into the nose—not from a funnel.

A series of 180 cases of pneumonia in children, in which 90 were treated with **mercurochrome** and the remainder used as controls, has been reported by L. D. Hoppe, L. H. Goldsmith and W. T. Freeman (Arch. of Ped., Oct., 1926). For all types of

pneumonia the average duration of illness without mercurochrome was 13.3 days and with it, 5.9 days. The mortality was 32.2 per cent., as against 8.9 per cent. In bronchopneumonia cases, of which 55 received mercurochrome and 61 did not, the mortality was 42.6 per cent. in the controls, as against 10.9 per cent. in those receiving the drug. The dose is 5 mgm. ( $\frac{1}{13}$  grain) per kilo. (2.2 lbs.) of body weight up to 19 kilos. (41.8 lbs.); above this weight 4 mgm. ( $\frac{1}{16}$  grain) is used, or 3 mgm. ( $\frac{1}{22}$  grain) in severe cases. Careful estimation of the weight and dosage avoids most of the severe reactions. The drug is injected intravenously where possible, otherwise intraperitoneally. Out of 36 cases treated intraperitoneally, 1 unfortunately died of verified colon bacillus peritonitis as a result of transfixion of a loop of intestine with the needle. Mercurochrome should not be used if calomel or other mercurial has been given shortly before.

According to H. W. Nott (Brit. Med. Jour., July 17, 1926), **potassium permanganate rectal injections** are of great efficacy in pneumonia, including bronchopneumonia. The solution used consists of pure potassium permanganate, 2 grains (0.12 Gm.), in "comfortably hot" water,  $1\frac{1}{2}$  pints (750 c.c.). From 3 ounces (90 c.c.) to  $\frac{1}{2}$  pint (250 c.c.), according to the age of the patient, are injected at a time. The fluid is administered slowly with a funnel and small tube, or with a Higginson's syringe, and the injections are repeated every 2 to 4 hours during the first 24 to 36 hours of treatment. The shorter intervals, 2 to  $2\frac{1}{2}$  hours, are used in severe cases treated late, *e.g.*, on the 4th or

5th day of the disease. When the temperature reaches normal in adults or older children the injections are reduced to 2 a day for 3 days, then once a day for 3 more days; but in infants or younger children they should be continued twice daily for at least 10 days after defervescence. The treatment is claimed to cause a rapid and permanent change for the better in the clinical picture. The cough becomes less harsh, respirations deeper, expectoration much looser; cyanosis disappears in 18 to 30 hours. After the 1st injection a child with advanced bronchopneumonia will fall soundly asleep, and can be kept sleeping by repeated small injections. The colored sputum suddenly disappears; not uncommonly one sees a bright red sputum in the morning and finds white frothy expectoration in the evening of the same day. Sometimes there is a little hemorrhage for an hour or so just before this change takes place. Crisis is not infrequent, but descent is by lysis in most cases, taking on an average 2 to 3½ days from the beginning of treatment.

In some cases **thyroid** was given by mouth along with the rectal permanganate treatment, but it is the latter that is regarded as having a specific effect.

Ten per cent. **glucose solution** is reported by B. Soria and E. Halac (Rev. de especial., Aug., 1927) as having reduced the mortality in 120 children with bronchopneumonia from 60 or 65 per cent. to 35 per cent. Administration by the intraperitoneal route was found most effective. To prevent any shock from this procedure the writers used **adrenalin** before or during the glucose injection.

J. A. Kerr (Lancet, Jan. 21, 1928) reports a case of bronchopneumonia and *auricular fibrillation* complicating *puerperal pelvic sepsis*. Search of the literature revealed no previous case of this sort ending in recovery. Auricular fibrillation had been present at least 4 days before the treatment was begun. On account of the complete cardiac breakdown with orthopnea and other complications, Eggleston's method of massive **digitalis** dosage was resorted to; 250 minims (15.4 c.c.) of a tincture of digitalis of known potency was given, without subsequent vomiting. Next day the patient was much more comfortable, the pulse ranging between 90 and 110 and being doubled in volume. There was only occasional irregularity. The bronchopneumonia improved on the right side, but remained the same on the left. The sputum became nummular and less frothy, and the urinary output increased. Recovery followed, although 12 days after the massive dose, further digitalis medication became necessary for a return of fibrillation, for which the patient thereafter required continuous treatment.

**BRONCHOSCOPY.**—Marked advantages to be derived in the clinical diagnosis of pulmonary disease from a combination of the diagnostic efforts of the internist, roentgenologist and bronchoscopist are emphasized by L. H. Clerf (Atlantic Med. Jour., Sept., 1926). Bronchoscopy for diagnosis is indicated in all cases in which there is a diagnostic question remaining after physical examination, and X-ray and laboratory studies have been carried out. It may aid in diagnosis in any patient with pulmonary disease in whose sputum no tubercle bacilli can be found. When there is doubt as to the need of bronchoscopy, the procedure should nevertheless be carried out if there are no definite contraindications.



In **bronchial asthma**, according to the same observer (Jour. Amer. Med. Assoc., Sept. 10, 1927), the best results are obtained in the treatment of patients who have a chronic tracheobronchitis with increased secretion, either mucoid or purulent. Little, if any, improvement can be expected in chronic tracheobronchitis with cyanotic swollen mucosa and practically no secretion. Bronchoscopic treatment consists of the removal of secretion and the endobronchial introduction of some form of medication. There is advantage in using the small flexible-tipped Lynch aspiration tube, which can be carried into the smaller bronchial subdivisions beyond the tip of the bronchoscope. Medication can be introduced by topical applications or by instillation. Its value is questionable. Introduction of **cocaine** and **adrenalin** during an asthmatic attack will nearly always give immediate relief. Immediately after bronchoscopy there usually occurs more frequent cough, with increase of secretion. Breathing is easier. This improvement may be brief or may continue for weeks or even months.

Chevalier Jackson (Jour. Amer. Med. Assoc., Sept. 4, 1926), reviewing the bronchoscopic and esophagoscopic phases of chronic non-specific lung conditions, called attention to 2 factors not often recognized, *viz.*, the importance of pathologic or congenital deformities of the bronchial tree in etiology, and the almost universal occurrence of lung complications, acute and chronic, from longstanding esophageal disease or foreign body. Esophagoscopy should accompany all diagnostic bronchoscopies.

In a case of **postoperative massive collapse of the lung**, G. Tucker (Surg., Gyn. and Obst., June, 1926) aspirated secretions from the trachea and bronchi. The collapsed lung cleared in 3 days, as against an average of 21 days in like cases not treated bronchoscopically. In these patients all the secretion cannot be removed from the smaller bronchioles by aspiration, and it may reaccumulate in the bronchi. Bronchoscopic aspiration should be repeated until the weakened respiratory force revives and there is a good return of the cough reflex.

According to H. J. Moersch and W. M. Boothby (Arch. of Otolaryng., Dec., 1927), it would be well to place all children in the oxygen chamber immediately after bronchoscopy, in order to decrease the labored breathing, reduce cyanosis, prevent edema as much as possible, not only of the larynx but also of the respiratory membrane, and reduce the possibility of bronchopneumonia by keeping the patient in the best possible condition to prevent its development. Oxygen should be used especially if laryngeal edema is marked and if pneumonia has developed. If an oxygen chamber is not available, the gas might be given through a portable oxygen tent or through a catheter.

### BRONCHOSPIROCHETOSIS.

—A. Castellani (New Orl. Med. and Surg. Jour., July, 1926) notes that a variety of spirochetes are found in this condition. They rarely exist alone, but are usually accompanied by cocci, fusiform bacilli, and in addition, an organism which the writer has called the *macrovibrio*—a curved, comma-like or banana-shaped bac-

terium. Infection takes place in most instances from affected to healthy persons, the spray exhaled in coughing being contaminated with the spirochete or the resistant cocci. In 3 cases autopsied, there was a patchy consolidation of both lungs and small foci of necrosis. The mucosa of the bronchi was swollen and infected, but there was no evidence of bronchiectasis. The infiltrated areas showed large numbers of spirochetes and the organisms already alluded to.

Among the wide variety of aërobic organisms encountered in bronchopulmonary spirochetosis, D. T. Smith (N. Y. State Jour. of Med., Feb. 1, 1927) mentions the influenza bacillus, streptococcus and pneumococcus. The organisms constantly associated with it, however, are anaërobic, comprising the spirochetes of the Vincent type, the fusiform bacilli, vibrios and cocci. The anaërobic organisms are found so often in the diseased tissues and their discharges during life as well as at necropsy that they are not merely contaminants, but the causal agents. The writer confirmed this by experimental work in animals. He classifies the 30 cases he has seen and 96 others collected from American literature in 12 groups: (1) Lung gangrene; (2) lung abscess following tonsillectomy; (3) lung abscess following extra-respiratory operation; (4) lung abscess complicating neoplasms of the lung; (5) lung abscess associated with a foreign body in the lung; (6) primary or spontaneous lung abscess; (7) unresolved pneumonias; (8) acute bronchitis; (9) bloody bronchitis; (10) putrid bronchitis; (11) chronic bronchiectasis; (12) any of the above associated with pulmonary tuberculosis. In chronic

cases with only bronchial involvement the writer found the blood largely normal. In cases with lesions of the parenchyma, however, secondary anemia was rather common and the white blood count ranged from 10,000 to 60,000, with a relative and absolute increase of the polymorphonuclears. Where the disease was largely in the bronchi, the physical signs were those of bronchitis or bronchiectasis—the latter demonstrable by intratracheal injection of lipiodol. In the cases with parenchymatous lesions, signs of lung consolidation were generally present, and the X-ray showed dense shadows, usually confined to 1 section of the pulmonary field. The 2 main complications were brain abscess and empyema, the former generally fatal, the latter with grave prognosis.

The same observer (Amer. Rev. of Tuberc., Mar., 1927) notes that the fusiform bacilli do not disappear from the sputum as do the spirochetes on standing, and are readily stained by gentian violet, methylene blue, and carbol-fuchsin. In searching for the spirochetes, therefore, it is advisable 1st to look for the fusiform bacilli. While it is generally assumed that spirochetes and fusiform bacilli are secondary invaders, if this were true, one would expect to find them in all forms of chronic lung disease. In 150 cases of uncomplicated tuberculosis, 6 of bronchial asthma and 5 of mycotic lung infections, spirochetes and fusiform bacilli were absent from the sputum on repeated examinations. The organisms are identical, however, with those commonly present in the mouth, which would seem to be the probable source of the pulmonary infection.

This is supported by experiments in which lung abscess and gangrene were produced in mice, guinea-pigs and rabbits by intratracheal inoculations of material recovered from the gums of patients with severe pyorrhea. Bronchial spirochetosis may be the cause of bronchiectasis; in all of 12 cases of the latter condition examined by the writer, mostly confirmed by iodized oil injection, spirochetes, fusiform bacilli and cocci were recovered from the sputum.

In a case reported by Marshall (Ky. Med. Jour., July, 1925), a man appeared at 1st to be suffering from acute endocarditis and multiple arthritis. He was expectorating much foul sputum resembling prune juice. The X-ray examination suggested tuberculosis. The sputum contained no tubercle bacilli, but enormous numbers of Vincent's spirochetes and fusiform bacilli. Recovery occurred under **arsphenamin**, given intravenously. The teeth constituted the primary source of the infection, leading to abscess formation at the root of the right lung.

In a man who had repeated hemoptyses and a hydropneumothorax, Ribierre and Kermorgant (C. r. Soc. de biol., Dec. 4, 1925) found no tubercle bacilli in the sputum, but a spirochete not corresponding to any known species. Injected into rabbits, this organism caused lung lesions resembling those in the patient. **Arsenical treatment** was given: The bloody expectoration ceased, the general condition improved, and the spirochetes disappeared from the sputum.

A discordant note has been sounded by Manson-Bahr (Trans. Roy. Soc. of Trop. Med. and Hyg., Jan. 31, 1927), who expresses doubt as to the existence of bronchospirochetosis. He believes the demonstration of spirochetes in the sputum to be devoid of clinical significance; its misinterpretation, he asserts, may lead to annoying and even serious results.

**TREATMENT.**—According to D. T. Smith (N. Y. State Jour. of Med., Feb. 1, 1927), rest during the toxic period of bronchial spirochetosis is as essential as in pulmonary tuberculosis. Spontaneous recovery took place in a few of his cases. Used early in the disease, **arsenical preparations** were sometimes particularly useful. **Postural drainage** often resulted in striking improvement of the symptoms. Operative procedures were availed of in a few cases, in general with encouraging effects. No instance of cure was recorded where the disease was of 6 months' duration or longer.

J. W. Visser (Amer. Jour. of Syph., Jan., 1927), in a case of purulent bronchitis due to Vincent's spirochete and the fusiform bacillus, gave 3 intravenous injections of **neo-arsphenamin**—0.15, 0.3 and 0.6 Gm., respectively—in the course of 2 weeks with the result that the organisms disappeared from the sputum, the amount of which declined to normal, while the cough and râles subsided and recovery ensued.

**Adrenalin** has been used by J. Sabrazès (Rev. franç. d'endocrinol., Oct., 1926) with marked success in a case of hemorrhagic bronchitis due to *B. fusiformis* and *Spirocheta bronchialis*, and in several other similar cases. In the 1st case, although all the ordinary remedies had been tried in vain in the course of 5 years, complete recovery took place in 3 months under 15 drops of 1:1000 adrenalin chloride solution in a little water by the mouth twice daily between meals. The adrenalin could instead be given by the nose or rectum, or injected subcutaneously or intramuscularly. Its action is reinforced by **dried supra-**

renal given orally or by injection. Injections of liquid pituitary were also sometimes used.

**BUERGER'S DISEASE. (THROMBOANGIITIS OBLITERANS).—SYMPTOMS.**—In approximately 5 per cent. of the cases of this disorder seen at the Mayo Clinic, according to E. V. Allen and G. E. Brown (Amer. Jour. Med. Sci., Sept., 1927), the pulsations of the dorsalis pedis and posterior tibial arteries were normal. The occluding vascular lesion involved the digital and interosseous arteries, or extended into the plantar, metatarsal or tarsal arteries. The signs of vascular obliteration were confined to the distal part of the foot and toes. Because of cyanosis or other color changes and normally pulsating arteries, Raynaud's disease was the usual diagnosis before admission. Cases reported in the male as Raynaud's disease with demonstrable changes in the small arteries are probably most frequently cases of thromboangiitis obliterans. All the accessible arteries of the extremities should be carefully palpated as a routine, as occlusion frequently occurs in other extremities and thus furnishes a clue as to the nature of the disease.

The patients with normally pulsating arteries of the feet have been, as a rule, free of symptoms in the affected extremity, although the disease may have pursued its usual course in the other extremities. The onset is sudden, with spontaneous pain and pallor in 1 or more toes or the distal  $\frac{1}{2}$  of the foot. Warming only partly restores the normal color of the tissue, although in some instances there is a complete return to

normal for a short time. Gradually the bluish discoloration increases and recovery is successively less complete. The pain increases and amputation becomes necessary. The frank gangrene or gangrenous ulcers of the type occurring in the cases of Buerger's disease with more extensive vascular obliteration do not occur, since amputation is needed for pain before this stage is reached. Healing is uneventful, owing to the adequate circulation proximal to the toes. Other toes may later be similarly affected.

G. R. Constam (*ibid.*, Oct., 1927) urges general adoption of the term thromboangiitis obliterans in lieu of the variety of terms that have been applied to the affection, *viz.*, *presenile gangrene*, *juvenile gangrene*, *endarteritis*, *endophlebitis*, *endangiitis obliterans*, *primary endarteritis obliterans*, and *spontaneous gangrene*. In only 24 of a series of 94 cases observed at the Mayo Clinic were symptoms due to lesions of the *upper extremities*. In 4 the lesion in the hands was the outstanding manifestation, and apparently they were involved primarily. In 1 case compression of the right hand by a tight glove, and in another a pinching of the 4th finger, were probably the inciting cause for the outbreak of the disease, which might have been present in a latent stage. In the upper limbs, the condition rarely leads to gangrene of more than a few fingers. Nearly always the lower limbs also are sooner or later affected. In all cases involving the hands, protective measures to the lower extremities are indicated, even if clinical evidence of their involvement is lacking. The 4 cases alluded to were all in gentiles.



**ETIOLOGY.**—In a study of 200 cases by Allen and Brown (Ann. of Int. Med., Feb., 1928), there was 1 patient 17 years of age and another probable case in 1 of 64 years. An accepted notion was also disproved in that 3 patients were non-smokers. Buerger has reported 3 cases in women. The disease has been said to occur predominantly in Russian Jews, but about  $\frac{1}{2}$  of the writers' cases were Austrians, Germans, Scots, Irish, English, Dutch, Greeks, Finns, Norwegians and native Americans. Eighty per cent. of the series were active workers in various trades, showing that occupation has no bearing on the cause. Only 3 of the 200 cases were free of foci of infection. The tonsils were infected in 80 per cent., and in over  $\frac{1}{2}$  of those whose prostates were examined there was observed a prostatitis of **clinical** importance.

Two cases in *women* are reported by E. D. Telford and J. S. B. Stopford (Brit. Med. Jour., June 25, 1927). In 1 the interval between onset of symptoms and total gangrene was only 3 months. The thrombosis spread throughout the arm so rapidly as to preclude any successful attempt at collateral circulation. The 2d case, on the other hand, was extremely chronic, the initial symptoms dating 6 years back. At a confinement 16 years before, the physician and nurse had been unable to find a pulse in either arm. Nevertheless, when the patient was seen, a good collateral circulation appeared to have been established.

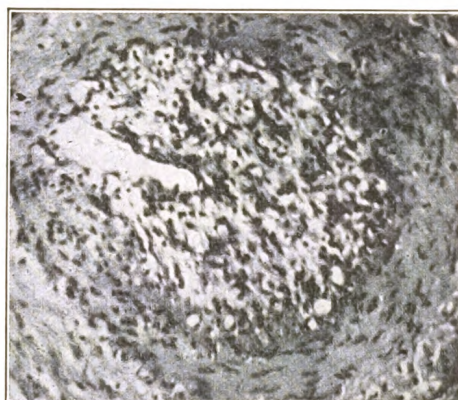
A case in a Jewish *child* of 2 years is recorded by J. A. Cahill, Jr., (South. Med. Jour., Feb., 1928). He had been suffering from furuncles with cer-

vical adenitis, seemed ill, and would not walk. One morning he screamed with pain, and blackish spots and gangrenous areas were found on both feet. A line of demarcation later formed at the lower  $\frac{1}{3}$  of the left leg and **amputation** was performed. Four toes on the right foot were also removed. The vessels showed a clot and evidence of arteritis. The probable cause was embolism. The diagnosis made was bilateral thromboangiitis with acute onset.

The statement has been made that thromboangiitis and syphilis do not occur together. R. P. Smith and D. W. Patterson (Brit. Med. Jour., Feb. 5, 1927), however, report a case in which a strongly positive Wassermann was obtained. The symptoms were pain, coldness of the feet, ischemia, intermittent claudication and erythromelalgia, ulceration of the leg and gangrene of the toe, with later extension of the disease to the other side. **Amputation** above the knee was followed by recovery. The femoral artery appeared practically occluded, and the popliteal and tibial arteries showed organized thrombi, partially recanalized. A condition of phlebosclerosis or phlebothrombosclerosis was found which, with the positive Wassermann and exclusion of other factors, suggested a syphilitic causation.

**PATHOLOGY.**—The characteristic lesion, as noted by Constan (*loc. cit.*), is an inflammatory thrombosis involving not only the larger veins and arteries, but also their finest branches, even the capillaries. A typically affected vessel shows organized thrombus, cellular infiltration of all the layers of the vessel wall, and fibrosis of the perivascular tissue.

In pathologic studies of 30 amputated limbs and 8 resected veins, Allen and Brown (Ann. of Int. Med., Feb., 1928) found the conditions to be essentially those described by Buerger, except in 2 respects, *viz.*, that evidence of acute inflammation was extremely rare, and that proliferation of the intima seemingly out of proportion to the age of the patient was found. These intimal changes may be prethrombotic. The disease is apparently of infectious origin, but in clinically acutely or subacutely



Artery from a toe in a case of Buerger's disease with vasomotor disturbances. The lumen is almost completely occluded by a fibrous mass firmly adherent to the vessel wall. Fibroblasts are numerous. (Allen and Brown, in *Amer. Jour. Med. Sci.*).

affected veins no specific organisms could be demonstrated.

In a case reported by J. Marnoch and E. MacRae (Jour. of Path. and Bact., Jan., 1927), the chief features were patchiness of distribution of the lesions in all arteries of the limb; obliteration in parts by well organized and canalized thrombus, the new channels in some cases being blocked by more recent thrombus; perivascular adhesions at the obstructed parts of the arteries, and such free formation of collaterals that the vessels showed in some parts considerable variation from the normal arrangement. All

vessels involved showed hyperplasia and splitting of the elastic tissue, especially the internal elastic lamina. The nutrient arteries of the nerves were affected to a moderate degree, being sclerotic, especially where the lumen remained patent.

**DIAGNOSIS.**—Allen and Brown (*loc. cit.*) point out that *vasomotor disturbances* of a spastic type simulating Raynaud's disease frequently occur in extremities with organic vascular obliteration characteristic of thromboangiitis obliterans. The association of vasomotor and organic disturbances leads to many errors in diagnosis. Vasomotor disturbances may be an early sign of obliterative vascular disease. When a young male adult manifests vasomotor disturbances without evidence of arterial disease the diagnosis cannot be made, but thromboangiitis should be suspected. Diminished or absent pulsations in the palpable vessels indicate an organic or occlusive vascular lesion. The symptoms of vascular occlusion (excessive fatigue or the pain of claudication), phlebitis, or color changes with change of position confirm the diagnosis of an obliterative lesion. These findings do not occur in the functional or vasomotor disturbances. The impaired blood-supply in thromboangiitis obliterans has a twofold basis: That related to thrombosis in the main arteries, and that due to a lack of maximal vasodilatation or, in some instances, to actual vasoconstriction in the collateral channels.

The process followed where differentiation is required between simple arterial embolism, Raynaud's disease, arteriosclerosis and thromboangiitis obliterans is illustrated in the following comments by the foregoing writers concerning such a case: The presence of pulsations in the pedal



vessels argued for a vasospastic disturbance with gangrene but was excluded by the absence of visible vasomotor disturbances and the sex (male) and age (37) of the patient. The absence of any demonstrable locus for emboli and the bilateral occlusion occurring separately would tend to eliminate simple arterial embolism. Arteriosclerosis was excluded by the age of the patient and the lack of demonstrable arteriosclerotic changes peripherally on X-ray examination. The ocular fundi and central nervous system showed no evidence of arteriosclerosis. The clinical diagnosis of thromboangiitis obliterans was made on the positive circulatory-efficiency test (abnormal pallor when elevated and abnormal rubor when dependent) of the distal portion of the foot, the occurrence of spontaneous non-healing ulcers, the sudden bluish discoloration of the toe associated with severe pain, and the occurrence of intermittent pain in the arch. Microscopic data confirmed the diagnosis. The later development of arch claudication indicated progression of the lesion to a higher level.

In every case of peripheral vascular disease, according to Constan (loc. cit.), the main vessels of all extremities should be palpated repeatedly. One should look for: (1) Pulseless vessels; (2) signs of vascular insufficiency; (3) vasomotor phenomena. Constant absence of pulsation alone does not permit a definite diagnosis, as congenital abnormalities can imitate lack of pulsation in typical places. It is doubtful whether the pulsation of a larger vessel disappears during an attack of Raynaud's disease. Signs of vascular insufficiency, viz., exaggerated rubor in the dependent position, pallor on elevation, exaggerated or retarded reactionary rubor, and rubor from changing from the elevated to the dependent position are, if constant, characteristic of an organic affection. Vasomotor phenomena (rubor, pallor, cyanosis, etc.)

occur in both organic and functional [Raynaud's] diseases. Only if no signs of an organic affection can be found can one make a diagnosis of primary functional vascular disease. Intermittent pallor and cyanosis are initial symptoms of thromboangiitis obliterans of the hands, but heat never leads to such a complete compensation or overcompensation of these vasomotor symptoms in thromboangiitis as it does in Raynaud's disease. Absence of demonstrable calcified arteries, age of the patient, and marked rubor of the fingers and toes make a diagnosis of endarteritis obliterans on an arteriosclerotic basis untenable.

*Blood-vessel visualization* in the living subject has been carried out in 10 men by J. B. Carnett and S. S. Greenbaum (Jour. Amer. Med. Assoc., Dec. 10, 1927). They find that 6 c.c. of iodized oil may be injected into the femoral artery of the average man with perfect safety. Under local anesthesia the artery is exposed and a small tape passed around it and made sufficiently tense to shut off the vessel during the injection. The leg has been elevated to empty it of blood. Roentgenograms of the thigh, leg and foot are taken immediately after the injection; the tape is then relaxed, and another series of pictures taken after 3 or 5 minutes. One of the 10 subjects was a case of thromboangiitis obliterans, which revealed a special tortuosity of the arteries of the entire limb. The writers cannot yet estimate the practical value of the procedure in the differential diagnosis of vascular conditions or as a test of vascular capability in gangrenes.

**TREATMENT.**—According to Allen and Brown (Ann. of Int. Med., Feb., 1928), additional experience with the disease has tended to favor conservative treatment. Amputation has been averted in many cases by

carefully and persistently carrying out medical and physical measures for long periods. The control of pain by the **injection of foreign proteins**, and the induction of vasodilatation by **lumbar ganglionectomy** in carefully selected cases, have likewise reduced the number of amputations. Recognition of the disease in the early stages is of utmost importance, as gangrene and similar serious sequelæ can be prevented in many cases.

In cases with extensive gangrene, with or without pain, the treatment is **amputation**. In cases with mild trophic changes and severe rest-pain, it consists of medical measures for pain, methods to increase the circulation, prophylactic measures and **removal of foci**; **lumbar ganglionectomy** and **ramisection** may be carried out in suitable cases. The extremity should be carefully **protected from trauma and cold**. **Smoking** should be **interdicted** or sharply diminished. **Postural exercises** should be done. Intravenous injections of **radium chloride** have temporarily relieved pain in 70 per cent. of cases, but equal results are obtained with **typhoid vaccine**.

**Intravenous injection of protein foreign** in the form of **typhoid vaccine** proved useful in a case alluded to by Allen and Brown (Amer. Jour. Med. Sci., Sept., 1927). The temperature of the left thumb and 1st finger was markedly increased and pain relieved. In another case, **sodium citrate** was given **intravenously** and **alcohol dressings** and **heat** applied locally, but later **amputation** became necessary. The fact that lack of maximal vasodilation, or even at times an actual vasoconstriction, in the collateral vascular channels accounts partly for the inadequate

blood-supply in some cases has led these writers to carry out **lumbar sympathetic ganglionectomy** in selected cases, with resulting increased blood-supply to the feet. In a case mentioned, improvement after this operation was marked. Pain disappeared and healing of the gangrenous areas started at once. There was definite evidence of increased blood-flow, with increased temperature of the feet, which was maintained 5 months later. In a case referred to by Constam (*loc. cit.*) a few injections of triple **typhoid vaccine**, **contrast baths**, **baking** and **postural exercises** caused ulcers to heal rapidly. In another case, 2 areas of gangrene healed in 4 weeks under contrast baths and postural exercises, but ulcers later formed elsewhere. Eventually **bilateral lumbar sympathetic ganglionectomy** (2d, 3d and 4th lumbar ganglia) was performed by Adson. Complete relief from pain followed; the skin temperature of the feet increased about 6° C. (10.8° F.), pulsation was constant in all the vessels of both feet, and an ulceration on a toe seemed to be healing.

Of 84 cases treated in 4 years with repeated **intravenous injections of hypertonic saline solution** only 12 per cent. came to amputation, according to S. Silbert (Jour. Amer. Med. Assoc., Sept. 17, 1927). A 5 per cent. solution of sodium chloride is used; it is prepared in freshly distilled water, filtered and immediately sterilized. For the 1st injection 150 c.c. (5 ounces) and for all subsequent injections 300 c.c. (10 ounces) are used. Injections are at 1st given 3 times a week, later twice a week, and subsequently at longer intervals as the case improves. The injection is given by



the gravity method, the fluid being run in in the course of 10 minutes, during which the patient is kept flat on his back.

In the conservative treatment Buerger's plan, as described by Sir William I. de C. Wheeler (Brit. Med. Jour., Feb. 5, 1927) is to induce **reactionary hyperemia** in the affected part by a preliminary elevation of the leg followed by its depression into a dependent position, which is effectual in the milder cases if the pain can be tolerated. The leg is then placed horizontally. This is repeated several times a day. **Bier's passive hyperemia** has been helpful. **Injection of alcohol** into the posterior tibial nerve relieves the pain. Intolerable pains in acute cases may call for amputation within a few weeks. It is also indicated when gangrene is spreading beyond the toes. The same rule holds as for senile gangrene as regards high or low amputation.

In 50 cases of circulatory disorders of the limbs, mostly instances of thromboangiitis obliterans, H. B. Philips and I. S. Tunick (Jour. Amer. Med. Assoc., May 16, 1925) employed **X-ray** treatment. The factors were: 5 ma., 100,000 volts, 5 mm. aluminum filter, and 15-inch distance. Exposures of 10 to 15 minutes alternating at weekly intervals over the mid-anterior and posterior aspects of the body were given, from the 10th dorsal to the 5th lumbar vertebra in lower extremity involvements, and over the cervical and upper 2 dorsal segments for the upper limb. While immediate relief from pain was obtained in several instances, the relief generally resulted in 2 to 3 weeks. Intermittent claudication disappeared after the 6th week in  $\frac{1}{2}$  the cases and

was improved in the remainder. Trophic disturbances improved in 4 to 6 weeks. Phlebitis improved at once, and ulcerations tended to disappear within 2 or 3 months. Gangrene soon tended to become dry. Marked general betterment was soon noticeable. Apparent cure of a severe case of thromboangiitis as well as 1 of *Raynaud's disease* from X-ray treatment is reported by K. H. Beall and S. Jagoda (South. Med. Jour., Aug., 1926).

Possible endocrin relationships of the disease are considered by Sicard (Bull. Soc. méd. des hôp. de Paris, Apr. 7, 1927). Unilateral **adrenalectomy**, he notes, has given striking and sometimes permanent success in most cases thus treated by von Oppel, Leriche and Hertz. Pain ceased and gangrenous processes began to heal. Ambard and Boyer have had success with **insulin**. As the disease is limited to males, the writer thinks **feminization** might be beneficial. His assistant, Wallich, gave subcutaneous injections of **woman's whole blood** in 10-c.c. doses and also an **ovarian extract** in 1 case, in which temporary arrest of the disease and postponement of amputation seemed to result.

Regarding **amputation**, Allen and Brown (Ann. of Int. Med., Feb., 1928) state that fingers can usually be successfully amputated regardless of the amount of obliteration in the ulnar or radial arteries. In their series the disease was never sufficiently extensive to require the amputation of hands or arms. Toes can be successfully amputated in only a small group in which the arteries in the feet are pulsating normally and the skin proximal to the toes is not discolored or edematous. Incision of toes or removal of the nails is never successful and always necessitates higher amputation. Amputation be-

low the knee is successful in 80 per cent. of all cases regardless of the condition of the pulsations in the popliteal artery, provided that the gangrene does not involve the leg and extensive lymphangitis or edema is not present.

**BURNS.**—A significant *lowering of the whole blood and plasma chlorides* was found by E. C. Davidson (Arch. of Surg., Aug., 1926) in a study of the metabolism of 31 cases. There was evidence that retention of sodium chloride took place. The diminished sodium chloride output in the urine was not due to primary kidney change, but rather to a lowering of the plasma chlorides to a level below the renal threshold. The disturbance of chloride metabolism seemed proportionate to the amount of tissue devitalized. There was evidence of increased protein catabolism. Administration of **sodium chloride** seemed advisable on the basis of the observations made. Davidson, with C. W. Matthew (*ibid.*, Aug., 1927), also points out that in extensive burns there is 1st an increased permeability of the capillaries, which explains the characteristic concentration of blood in such cases. There is no evidence that this increased permeability persists during the period of toxemia. The late changes in the plasma proteins are probably dilution phenomena. The plasma fibrin and globulin in burns show a characteristic rise, and the albumin shows a fall in concentration.

**GENERAL TREATMENT.**—The Committee on Burns of the Medical Society of the State of Pennsylvania, consisting of C. H. Frazier, J. M. Wainwright, J. B. Lowman and I. S. Ravdin, in a report (Atlantic Med.

Jour., Jan., 1926), notes that in a burn of considerable extent after 24 hours there is a period of 2 to 4 days in which the symptoms are those of toxemia. Toxins absorbed are formed by the action of the heat on the tissues. In extensive burns there is always a loss of heat due to peripheral vasodilation. This is to be feared most in burns without charring, as chars prevent heat dispersion. Pain and heat loss act in a vicious circle to increase and prolong the initial shock. For pain, the Committee suggests the use of **packs of 0.5 per cent. novocaine** solution. Parallel with the vasodilation there is increased permeability of the vessels, with resulting loss of circulatory fluids. The toxic protein becomes rapidly absorbed because of widespread vasodilation. Local **vascular constriction** to prevent the absorption, along with **early removal of the necrotic tissue**, will save many lives. The recovery from toxemia upon early débridement is astonishing. Rapid and continuous administration of **fluids** results in toxin elimination and a gradual reduction of the blood concentration with marked improvement in the systemic signs and symptoms. If the toxemia is overwhelming the **exsanguination-transfusion** treatment of Robertson and Boyd offers much promise; it is best used in connection with débridement. After about 96 hours, lytic substances are present in the body in sufficient amount to disintegrate the toxin. Plasma carbon dioxide estimations never showed the slightest degree of acidosis in extensive burns.

In a burn case, the patient is undressed immediately or not, according to the degree of shock. As soon as

possible, all **clothing** should be **removed** and an **electric cabinet** placed over the bed. The burned area is then covered with gauze saturated with 0.5 per cent. **novocaine** with 10 minims (0.6 c.c.) of 1:1000 **adrenalin** added to each fluidounce (30 c.c.). When the patient has reacted from shock, a 2d degree burn has become sufficiently anesthetized to allow removal of the burned skin and opening of the blebs without causing pain. In a 3d degree burn the patient is anesthetized and careful **débridement** done within 24 hours. **Fluid** is given by mouth, unless rapid intravenous administration is thought necessary. The novocaine packs are used for 48 to 96 hours, according to the extent of burn and the time of **débridement**. On their removal, the area is sprayed every 3 hours with fresh 2 per cent. **dichloramine-T** solution. In less extensive burns, **packs of normal saline solution** are used.

Combating shock by **rest in bed** with **external heat**, B. E. Sayre (Ill. Med. Jour., Oct., 1925), in an extensive burn, immediately starts giving **normal saline solution intravenously**. In a child of 6 years, 500 c.c. (1 pint) can be given.

For the relief of pain, **morphine** and **atropine** are given according to needs. When shock is somewhat reduced, **tap water** is given **by rectum** in mild cases. In severe cases, fluid is given by **duodenal tube**, passed down as far as possible, and a syringe every  $\frac{1}{2}$  hour or Murphy drip connected with the tube. Locally, the simplest method is to **spray on liquid albolene** 3 times a day and expose the burn to an **electric light cradle**. This avoids dressings and gives rapid, satisfactory results.

Intravenous injection of 100 c.c. ( $3\frac{1}{2}$  ounces) of **20 per cent. sodium chloride** solution was followed by rapid and continued betterment in a case of extensive superficial burns recorded by I. A. Bigger (South. Med. Jour., Apr., 1926).

According to G. Riehl, Jr. (Arch. f. Derm. u. Syph., Apr. 23, 1927), **blood transfusion** is very useful in severe burns. Among 32 cases, the lives of 10 are believed to have been saved by it, while in 11 a considerable prolongation of life was obtained. The amount of blood transfused was 200 to 300 c.c. The measure should be carried out early.

In experiments on superficial burns in rabbits, H. M. Greenwald and H. Eliasberg (Amer. Jour. Med. Sci., May, 1926) observed, after an initial shock stage with high blood sugar due to hyperactivity of the suprarenals, a secondary stage of exhaustion due to degenerative changes, particularly in the suprarenals. In this secondary stage, **adrenalin** may be given.

**LOCAL TREATMENT.**—Treatment with **tannic acid** has been recommended by E. C. Davidson (Surg., Gyn. and Obst., Aug., 1925). The burned area is covered with dry sterile gauze pads held in place by sterile gauze bandages. This dressing is then soaked with *freshly prepared* 2.5 per cent. tannic acid solution. To prevent deep caustic injury, small sections of dressing are opened for inspection in 12, 18 and 24 hours. When a light brown color is seen, all dressings are removed; this is facilitated by wetting the gauze with fresh tannic acid solution. The wound is thereafter left exposed to the air, but carefully protected from mechanical injury, chilling or bacterial invasion

by a **cradle draped with sterile linen**. In the more serious cases 1 or more incandescent bulbs are placed within the cradle. In burns about the *eyes*, a 5 per cent. **tannic acid ointment**, with a base of equal parts of petrolatum and hydrous wool-fat, is substituted for the solution. The initial burning by the tannic acid is followed by permanent relief from severe pain within  $\frac{1}{2}$  hour. Marked diminution in the amount of scarring results from this treatment.

The **tannic acid** treatment is endorsed by F. W. Bancroft and C. S. Rogers (Ann. of Surg., July, 1926). They use 2.5 to 5 per cent. solutions. When the burned area becomes mahogany brown the dressing is removed and **heated dry air** is used, a tent being generally erected over the bed and electric lights inserted. The patient is kept as surgically clean as possible. Toxemia seems less marked than in cases of like severity treated by other methods. The tanned area has a leathery consistency. If the crust remains dry, the temperature, pulse and white cell count early become normal. If serum and pus collect beneath the crust, they rise, whereupon the crust should be removed. The precipitation of protein by the tannic acid and the drying of the coagulum render the burned tissue innocuous. The almost waterproof covering afforded by the crust prevents loss of fluid. Care of the patient is relatively simple. Coagulation of the burned area by **spraying** tannic acid on it is easily effected and subsequent exposure to air and warmth without dressings is well tolerated. In 1st degree burns the crust is displaced by the new epithelium as it grows beneath it. In

deeper burns the crust can be removed by softening it with **petrolatum** and cutting it away. After its removal the base can be prepared for **grafting** by **compresses of saline** or **Dakin's solution**. The burned area becomes entirely insensitive owing to the local analgesic action of the tannic acid.

C. S. Beck and J. H. Powers (*ibid.*) note that the **tannic solution** can be made by the laity by mixing 4 teaspoonfuls of the dry powder in a glass of water. This makes approximately a 2.5 per cent. solution. Tannic acid is easily procured and can be kept indefinitely as powder. It should be kept at first-aid stations in steel mills, mines, factories, etc., for immediate application by compresses or spray.

**Tannic acid** is favored also by J. C. Lindsay (Can. Med. Assoc. Jour., Jan., 1927), who uses a 5 per cent. solution and believes the time required for healing is much shortened by the remedy, and by S. J. Seeger (Wis. Med. Jour., Jan., 1928).

In China, where tea is the national beverage, J. K. Shen (China Med. Jour., Feb., 1927) endorses strong infusions of **tea**, which contains tannic acid, as a widely available remedy for burns. A 15-minute, 8 per cent. infusion of average green or black tea is suitable. Boiling for 3 minutes will sterilize it.

After combating shock, D. Goldblatt (Ann. of Surg., Apr., 1927) applies  $\frac{1}{2}$  strength **tincture of iodine** to sterilize the burn and follows it with a wet dressing of sterile **10 per cent. sodium bicarbonate solution**. In the loose fluffs of gauze are incorporated several small rubber tubes of the Carrel type. The dressing can thus easily be saturated periodically without removal of the bandages. After 24 to 48 hours, shock having nearly



or quite disappeared, a new dressing of similar type is used for 2 or 3 days, until acute inflammation has passed off.

All the dressings are now removed, the blisters opened aseptically, and the burn exposed to direct sunlight for 5 minutes every 2 hours, increased to 20 minutes, with exposure to the air during the intervals. If sunlight is not available, electric lights may be used.

At night, a wet bicarbonate dressing is applied.

A local detoxication treatment of burns is lauded by W. R. Wilson (Brit. Med. Jour., Jan. 8, 1927). The object is to induce abundant serous exudation and then get the latter away from the burn. He uses mostly a hypertonic antiseptic solution consisting of standard eusol solution (20 per cent.), 1 part; 10 per cent. sodium chloride solution, 2 parts; water, 2 parts. Sometimes a solution weaker in salt, or glycerin, is substituted. The antiseptic effect is exerted only at the start, the characteristic odor of the eusol disappearing in 2 hours or less in spite of a covering of jaconet. After this the dressing is merely an aseptic one. The solution should be used for the 1st few days in every case. The eusol should not be heated. The dressings should be thoroughly wet when applied, require changing frequently, and may be expected to be dripping when taken off, besides leaving pools on the impervious sheet.

D. Mackenzie (*ibid.*, Mar. 5, 1927) advocates immediate removal of all dead tissues under general anesthesia, followed by copious use of Wright's hypertonic saline solution. Reschke (Arch. f. klin. Chir., July 12, 1927) endorses Tschmarke's treatment, which

consists of instituting general anesthesia and thoroughly cleansing the burn with soap and water and alcohol. The procedure is not contraindicated by burning of  $\frac{1}{3}$  of the body surface nor by the presence of slight shock. Control cases showed that this treatment shortens the healing time and avoids infection and pain. Cappelletti (Semana méd., Mar. 31, 1927) witnessed very favorable effects from the use of dressings impregnated with brewer's yeast.

A gelatin dressing for burns is recommended by H. S. Fist (Jour. Amer. Med. Assoc., May 7, 1927). It is prepared by dipping gauze into a hot, dilute solution of pure gelatin, drying it, treating it with  $\frac{1}{2}$  strength formaldehyde solution (U. S. P.), and finally washing and drying it. When dry, this gauze is slightly stiffer than paraffined gauze, but softens somewhat when moistened. Before the gauze is applied, the surface should be well cleansed and then dried, preferably by means of hot air. The dressing is removed daily, the wound cleansed and dried, and a new dressing applied. The gelatin gauze is unaffected by moisture, will not stick to a granulating surface, and may be sterilized in an autoclave and kept in a warm climate. Granulation proceeds with great rapidity under this dressing.

**Post-operative Burns.**—J. W. Dowden (Lancet, Nov. 6, 1926) points out that, the greater the operative shock, the less likely is the patient's skin to react to hot bottles. Heat which would not burn a healthy, conscious person will burn a shocked one. In bad cases hot bottles only add to the shock.

Thus, a post-operative patient should be placed between blankets that have been warmed by hot bottles and the bottles removed when the patient is

returned to bed. In many places nowadays a cage can be placed over the patient with an electric bulb attached, a blanket intervening between the patient and the bulb. The writer has seen in consultation several cases of severe post-operative burns.

**Acid and Alkali Burns.**—According to experimental work by E. C. Davidson (Ann. of Surg., Apr., 1927), treatment of these burns by washing the burned area thoroughly with plain water is superior to neutralization. If the latter measure is employed, it should be applied only after a maximal amount of the caustic has been removed by washing.

**BUTESIN PICRATE.**—J. G. Parsons (Northw. Med., June, 1926) looks with favor on butesin picrate as an antiseptic anesthetic, useful in eye, ear, nose and throat surgery. In the removal of superficial foreign bodies, the 1:2000 aqueous solution is serviceable, producing almost instantaneous anesthesia. The 1 per cent. ointment is useful in corneal burns and ulcers, and as a post-operative dressing. It is of value for impregnating gauze employed in packing the nose after septum or antrum operations. The aqueous solution exerts a beneficial sedative and antiseptic effect in hyperesthetic rhinitis and after nasal operations and tonsillectomy. After the latter operation, local discomfort is greatly reduced by a powder consisting of a 1:19 mixture of butesin picrate and acetylsalicylic acid.

## C

**CAFFEINE. —PHYSIOLOGIC ACTION.**—Studying, according to the Fick principle, the output per minute of intact hearts in dogs, C. Pilcher, C. P. Wilson and T. R. Harrison (Amer. Heart Jour., Aug., 1927) found that intravenous and subcutaneous injection of caffeine sodio-benzoate in doses comparable to therapeutic doses for human beings caused a decrease in the output of less than 10 per cent. Larger doses produced a proportionally greater decrease. These experiments suggest that caffeine sodio-benzoate in therapeutic doses has no direct beneficial action on the circulation. No significant change was observed in the respiratory rate or depth.

In observations on the effects of black coffee on sense acuity, R. Allers, E. Freund and L. Prager (Arch. f. d. ges. Phys., Mar. 23, 1926) witnessed modifications in the visual fields and in the normal tendency to exaggeration of peripherally seen movements. One of the 3 subjects, whose pulse was also markedly slowed, showed contraction of the visual field by 20° outward and by 10° above and below. In the 2 others, in whom the pulse was accelerated, 1 showed enlargement of the visual field by 10° and the other, no change.

**THERAPEUTICS.**—Suggestive in view of the above studies of Pilcher *et al.*, is the observation of Grossmann and Lusicky (Wien. klin. Woch., Apr. 15, 1926), that a material clinical effect on the circulation and central nervous system was obtainable only with pure caffeine or black coffee, while the double salts of caffeine seemed ineffectual.

As a heart tonic, Preobraschensky (Zeit. f. d. ges. exp. Med., Apr. 28, 1927) approves of giving caffeine where heart conduction is disturbed. It may also be combined with digitalis with advantage, tending to overcome certain toxic effects of this agent.

**CALCIUM. —PHYSIOLOGIC ACTION.**—In studies on the action of calcium chloride injected intravenously on the heart in rabbits and frogs, E. Frommel (Arch. des mal. du cœur, Feb., 1927) found the effects almost the same whether the vagus was intact or was paralyzed by atropine or severed. Evidently, the vagus plays no significant part in the action of the drug, which may affect the heart-muscle directly or through the intracardiac ganglia. Calcium possesses, however, properties of

reinforcing the heart's contractions, increasing cardiac irritability and reducing cardiac conductivity which render it analogous to digitalis.

Calcium chloride given intravenously increases the *acidity of the gastric contents*, according to Petrovic (Arch. f. Verd., Dec., 1926). This effect is not counteracted by atropine.

In a study of the *absorption* of calcium from the human intestinal tract, J. H. Roe and B. S. Kahn (Jour. Amer. Med. Assoc., Mar. 26, 1927) found that the serum calcium concentration of normal fasting subjects is definitely elevated by the oral administration of sufficient amounts of *calcium lactate* in aqueous solution. The optimal dose of this salt is approximately 5 Gm. (75 grains). Simultaneous ingestion of various foods with 5 Gm. and larger amounts of calcium lactate produced a marked depression of the rate of absorption of calcium. Since proper oral administration of calcium salts has been shown to elevate the serum calcium level for extended periods, it is no longer necessary to incur the dangers of the intravenous technic. The best therapeutic results are obtained by giving the 5 Gm. of calcium lactate in aqueous solution at least  $\frac{1}{2}$  hour before breakfast and at bedtime at least 3 hours after the last food was taken. The writers' observations may account for the frequent failure of calcium to prevent or cure rickets. The low absorbability of calcium when mixed with foods is probably due to a depression of the solubility of calcium by the alkaline digestive fluids secreted into the intestine when food is introduced. The writers' blood serum calcium curves after ingestion of 5 Gm. of calcium chloride show a progressive rise reaching its height after 4 to 6 hours, and with the serum calcium not yet down to normal at the 8th or 9th hour. In a previous paper (*ibid.*, June 5, 1926) they had reported from the 5 Gm. dose given to normal medical students an average rise of serum calcium of 80 per cent. A dose of 20 Gm. gave practically no additional rise (81 per cent.). The writers state that their experiments are not to be interpreted as indicating that the calcium of foods is not readily absorbed.

The same observers (Jour. of Biol. Chem., Mar., 1926) have described a new colori-

metric method of serum calcium determination which they employed in their studies. The calcium is precipitated as calcium phosphate from an alkalized trichloroacetic acid serum filtrate, and estimated as phosphate by the Benedict and Theis molybdc oxide colorimetric method, slightly modified.

According to the observations of W. Berger, E. Tropper and F. Rischer (Klin. Woch., Dec. 17, 1926) in normal men given 5 Gm. of calcium lactate on an empty stomach, the absorption of calcium is greatly increased by simultaneous ingestion of 0.1 Gm. ( $1\frac{1}{2}$  grains) of *saponin* in the form of *saponinum purum albissimum* (Merck). Whereas the calcium salt alone only increased the blood calcium by 2 to 7 per cent., with the addition of saponin it was increased by 23 per cent. The effect of the saponin is ascribed to an increase in the permeability of the intestinal wall.

**METABOLISM.**—Popowa (Zeit. f. Kind., Feb. 1, 1928) found that feeding pregnant rats with defatted foods caused weak progeny with severe disturbances of ossification. This would suggest an important rôle on the part of the lipoids in the assimilation of calcium. When guinea-pigs were inoculated with virulent tubercle bacilli while receiving food rich in vitamine C, tuberculosis developed very slowly and was mild; the blood calcium was normal or even above normal. On the other hand, in guinea-pigs inoculated while scorbutic, with decreased blood calcium, the tuberculosis ran an unusually speedy fatal course. Hypocalcemia in either experimental scurvy or tuberculosis implies a severe course. Hypocalcemia and hypercalcemia should be given consideration in diagnosis and prognosis.

Studies have shown that only a very small percentage of the cases of clinical *hypocalcemia* show a quantitative reduction in the blood calcium, as noted by S. Ayres, Jr. (California and West. Med., July, 1927). Pottenger considers that the symptoms of calcium deficiency are due to relative disproportion between the calcium and potassium ions, the latter being present in excess. This might answer the objection that the blood lime is found to be normal in clinical hypocalcemic conditions such as asthma, hay-fever, eczema, urticaria, psoriasis, acne, furunculosis, etc. Pottenger points

out that certain pathologic conditions such as those just enumerated are accompanied by vagus hyperactivity which occurs in the presence of a relative excess of potassium ions over calcium ions, and that the giving of an excess of calcium stimulates the sympathetic system and relieves the clinical symptoms.

According to A. T. Cameron (Can. Med. Assoc. Jour., July, 1926), the parathyroids produce an internal secretion which controls the formation of a non-diffusible calcium compound in the blood. This, by a series of interlocked equilibria, keeps the diffusible calcium compounds of the blood to a constant ratio with itself. If the parathyroids function normally, the compound under their control will be kept at constant concentration, and therefore the total blood calcium will remain constant. The slightly higher value for the plasma calcium of infants' blood suggests a more active parathyroid function. This theory, to be complete, must take into account the further control by vitamin D. We have as yet no evidence to determine the nature of this control, though it seems to be closely interwoven with that of inorganic phosphate.

**THERAPEUTICS.**—The percentage content of calcium in the foods most rich in it is given by Cameron (*loc. cit.*) thus: Hard cheese, 0.8; cottage cheese, almonds, 0.2; dried beans, 0.16; egg yolk, 0.14; whole milk, cauliflower, olives, 0.12; buttermilk, 0.11; peanuts, 0.10; oatmeal, lentils, 0.09; walnuts, 0.08; celery, dates, 0.07; whole eggs, spinach, 0.06; string beans, carrots, 0.05. Fish and meat contain very little calcium (0.002 to 0.01).

O. Loew (Med. Jour. and Rec., Jan. 4, 1928) advocates giving a combination of calcium lactate with sodium lactate as the double salt *calcium-sodium lactate*. Such administration not only employs the calcium in a most convenient form but enhances calcium retention and assimilation. In addition, the sodium lactate exerts a beneficial effect on the consistency of the stools, which are often unduly compact when calcium lactate alone is given.

Experiences with 200 intravenous injections of 10 c.c. (160 minims) of 10 per cent. calcium chloride for its action on the heart are described by Kevdin (Klinichesk. Medits., Feb., 1926; Jour. Amer. Med.

Assoc.). In either healthy or ill subjects, the heart contractions became slower, the pulse wave increased, as also the systolic pressure, while the diastolic dropped. Calcium seemed to be of help in **acute insufficiency of the heart**, when associated with strophanthin or digitalis. It may be especially indicated in **chloroform poisoning**. In **chronic heart insufficiency**, it is a useful adjuvant of digitalis. Good results were obtained in purely functional disease of the heart, from disorders of the vegetative system. The treatment here is evidently only symptomatic. Intravenous injections of calcium act on the heart functioning for no longer than 15 or 20 minutes. Therefore, continued use of the drug by the mouth is preferred.

In **cardiac failure with edema**, where constant rest in bed, digitalis and various diuretics have failed to yield a satisfactory diuresis, calcium chloride may, according to H. N. Segall and P. D. White (Amer. Jour. Med. Sci., Nov., 1925), be used as a **diuretic** in doses of 10 to 15 Gm. (150 to 225 grains) a day. The diuretic effect seems to be due to its influence upon water metabolism in the tissues rather than upon the circulation, for studies of the heart-rate, blood-pressure, vital capacity and electrocardiogram indicated that calcium chloride has no digitalis-like action on the heart. The writers used a solution of 2.5 Gm. (38 grains) of the salt diluted in 50 to 100 c.c. (1½ to 3 ounces) of water. In most cases 6 such doses were given daily at 2-hour intervals. To obviate the unpleasant taste, the drug may be given dry in capsules each containing 0.5 Gm. (7½ grains). Larger doses, such as 5 or 8 Gm., cause burning in the epigastrium which is relieved by taking food. Large doses in 2 normal subjects caused a moderate diuresis attended with acidosis. Six cases of refractory cardiac edema responded to calcium chloride by a well-marked diuresis, which began on the 1st to the 5th day and in 3 cases only stopped after discontinuance of the drug for 1 or more days. In 9 other cases the drug failed to cause diuresis.

H. Sieben (Med. Klin., June 3, 1927) finds a *calcium-gum arabic* solution very useful in **poisoning by metals** and some forms of **dermatitis**. In a case of **dermatitis due to novasurol injections**, refractory



to treatment for over a year, marked betterment occurred within 24 hours after injection of 1 Gm. (15 grains) of calcium chloride and 0.3 Gm. (5 grains) of gum arabic in 10 c.c. (160 minims) of water. After 2 more injections given at intervals of 1 and 2 days, the condition disappeared entirely within a few days. A complicating diarrhea was also stopped by the treatment. Favorable results had previously been obtained in a case of **arsphenamin dermatitis**. The gum arabic seems essential for good effects, apparently acting through its colloid nature. **Arsphenamin reactions** are preventable by preliminary injection of the preparation, vomiting, fever, headache, etc., never occurring after this procedure. The use of calcium-gum arabic solution in **lead poisoning** is indicated. It also renders prolonged treatment with novasurol possible.

**CANCER.—ETIOLOGY.**—Numerous investigations on various agencies apparently promoting or hindering the development of cancer continue to be recorded.

For instance, J. C. Mottram (Lancet, Dec. 10, 1927) supplies evidence not only of the origin of carcinoma in situations of *diminished blood-supply* but believes that its spread through the body, such as lymphatic permeation, and growth in lymphatic glands, spleen, liver and bone-marrow suggests that situations distant from the circulation are favored. There is evidence that an environment of *high carbon dioxide tension* encourages cells to anabolize, de-differentiate, and grow, whilst an abundance of oxygen and absence of carbon dioxide have a reverse effect. In the writer's experiments no evidence of cellular activity was obtained in the complete absence of oxygen, even when glucose was added, but Jensen's rat sarcoma presents activity at much lower tensions of oxygen than do normal cells. Diminished blood-supply results in

both increased CO<sub>2</sub> tension and diminished O<sub>2</sub> tension.

In malignant tumors of rats and mice, Harde and Henri (C. r. Soc. de biol., Mar. 4, 1927) obtained evidence that an *acid medium* may favor the growth of cells *in vivo*.

L. Pearce and Van Allen (Jour. of Exp. Med., Mar., 1927) report that with a transplantable neoplasm of rabbits the level of malignancy proved to be low in an environment of constant *light* (excluding the shorter ultraviolet rays), while in constant darkness the level of malignancy was somewhat lower than in control animals living under ordinary indoor light conditions, but not as low as among the animals constantly illuminated.

In experimental corroboration of the fact that *manipulation* of the growth is a dangerous procedure in human cancer, M. C. Marsh (Jour. of Cancer Res., Mar., 1927) finds that violent prolonged massage of spontaneous mammary tumors in 50 mice increased the percentage of mice bearing macroscopic metastases from 40 to 62.

W. Caspari (Arch. f. klin. Chir., July 12, 1927) accords with Mottram in certain respects in asserting that cancer cells arise from the adaptation of normal cells, in a region with deficient blood-supply, to an anaërobic metabolism. He postulates the existence of necrohormones or proliferation substances, identical with Gye's invisible virus, which, according to their concentration, excite cell division or kill cells. For the production of cancer there must be added to the necrohormones a deficient blood-supply, entailing lack of oxygen. Normal cells oxidize food material by

means of oxygen, whereas the cancer cell has a fermentative metabolism, even when it obtains enough oxygen. On this basis *precancerous states* should be treated with **heat** and other measures to bring blood to the part.

According to the theory of Ellice McDonald (Med. Jour. and Rec., June 15, 1927), cancer is due to an *increase of the univalent elements* (such as sodium and potassium) over the bivalent elements (such as calcium and magnesium), this condition producing such an increase of cell-membrane permeability and of conductivity as will favor cell division. Radiation aids in treatment by increasing the hydrogen ion concentration of the blood serum and by stimulating ionization of the bivalent substances, especially calcium.

From the continuing experimental studies of Maud Slye (Jour. of Cancer Res., June, 1927), certain definite conclusions have been reached: In every respect, the behavior of cancer observed daily for 18 years was inconsistent with the germ and diet deficiency theories of cancer. Cancer is not contagious; in protracted experiments it was never possible to transmit it by contact. Two factors seem to be necessary for cancer production, *viz.*, *inherited susceptibility* and suitable irritation or chronic stimulation or trauma. Upon avoidance of irritation of locally susceptible tissues, cancer has not occurred even in susceptible individuals. Infections or faulty diet might in some cases supply the chronic irritation factor. Spontaneous cancer has always seemed to be due to the lack of a mechanism fitted to control proliferation and differentiation in regenerative growth processes. The fact of the inheritability of re-

sistance to cancer is one of the few hopeful observations ever made concerning the disease, because it means that, instead of every one being susceptible, large numbers are wholly resistant.

Regarding experimental *tar cancer*, Stajano (An. de la Fac. de med., Montevideo, Oct., 1925) has noticed an apparent *neurotrophic action* whereby, on painting with tar, the latter acts not only locally but produces tumors also at certain definite distant points, so located as to imply a nervous factor. Upon painting the inside of the ears of rabbits, tumors developed also at a certain point on the outside of the ears.

According to Kreyberg (Zeit. f. Krebsf., Jan. 26, 1928), coal-tar produces a local, lasting and pronounced *anemia* which is a factor in the subsequent cell proliferation.

S. Beck (*ibid.*, Jan. 15, 1927) was able in mice and rabbits to elicit an *induced predisposition* to tar cancer by preliminary intravenous injections of tar emulsion for several months. Subsequent intracutaneous injections of tar in the animals thus prepared induced tumors,  $\frac{1}{2}$  of which developed into cancer, whereas controls not receiving the preliminary injections reacted only with a temporary epithelial proliferation.

B. Bloch and F. E. Widmer (Arch. f. Derm. u. Syph., Dec. 31, 1926) found that the constituents of tar causing cancer are particularly those which distill over between 275 and 284° C.

Neither nitrogen, sulphur nor arsenic are contained in these compounds, which are in all probability unknown cyclic hydrocarbons of high molecular weight.

According to Silberstein, Freud, Revesz and Schneid (Zeit. f. d. ges. exp. Med., Apr. 28, 1927), *insulin* confers considerable protection against the development of cancer in tarred mice; combination of insulin with dioxycetone further increases the protective effect.

The *parasitic theory* of cancer has been much discussed of late, in particular because of the discovery reported by W. E. Gye and J. E. Barnard (Lancet, July 18, 1925) of a minute organism filtrable through a Berkefeld filter but visible in an ultramicroscope developed by Barnard. The virus, according to these observers, requires, to become active, an activating substance, obtainable in the supernatant fluid after centrifuging at high speed an emulsion of tumor, or by treating a tumor with chloroform. Sittenfield (Amer. Jour. of Roentg., Dec., 1926), in attempts at the production of mouse sarcoma by a cell-free filtrate, partly confirmed Gye's work, but not as regards the coöperation of a non-specific and a specific factor. Flu (Ned. Tijd. v. Gen., July 24, 1926) was unable to confirm Gye's assertions, but showed that extracts of either malignant tumors or normal organs could activate a subinfectious unit of the Rous sarcoma virus, rendering it lethal. He concluded that Gye's phenomenon was essentially 1 of aggressin formation; when bacteria introduced into the system form aggressins, a sublethal dose becomes a lethal one. J. H. Mueller (Jour. of Exp. Med., Feb., 1927), in 1 year of experimentation, could not duplicate either Gye's results or the modified confirmations of Murphy and Flu. He lays stress on the difficulty of con-

trolling all factors involved, and while not stating definitely that Gye's theory is wrong, believes more evidence in its support is needed. J. A. Kolmer and M. J. Harkins (Jour. of Cancer Res., Oct., 1927) obtained results failing to confirm Gye's hypothesis.

J. Loudon, J. M. McCormack and N. J. Howard (Med. Jour. and Rec., May 5, 1926) reported having isolated a *pleomorphic organism* from various malignant growths in man and animals. Injection of it into animals, with a trace of infusorial earth, produced malignant metastasizing growths. The organism could be recovered in pure culture from these primary and secondary animal growths. The writers regard the micrococcus isolated by Nuzum from carcinomatous tissues and the organism described by Gye and Barnard as individual stages in the life cycle of their pleomorphic organism.

From 21 closed human carcinomas or sarcomas, F. Purpura (Policlin., May 15, 1926) constantly obtained a *coccus* occurring in groups of 2 or 4; from 6 of the cases filamentous forms were also obtained. Their apposed surfaces were flattened, and they were usually surrounded by a mucoid substance. The pathogenic power of these germs was proven in animals. The writer concludes that tumors can be produced by the continual irritating action of bacteria.

According to A. Heyninkcx (Le Scalpel, July 9, 1927), the greenish tartar met with in cases of cancer of the respiratory or digestive tracts embodies organisms capable of producing cancer, as evidenced by his findings in mice.

Several authors have reported observations suggesting the existence

of a transmissible extracellular carcinoma substance. Koose and Lemmel (Beitr. z. klin. Chir., cxli, 489, 1927) accept the occurrence of such a substance in view of the fact that exposure of various animal growths to the freezing effect of liquid air for 30 minutes to 4 days failed to reduce their virulence, whereas tissue cultures never survived more than 5 minutes' exposure to such freezing. V. Bisceglie (Zeit. f. Krebsf., May 20, 1926), injecting mice with a filtrate of mouse adenocarcinoma and transplanting the latter tumor in the same mice, observed much more rapid development of cancer in these animals than in unprepared controls. Growth of cancer *in vitro* was likewise accelerated by the filtrate. M. R. Lewis and H. B. Andervont (Amer. Jour. of Hyg., May, 1926) found that the Rous sarcoma and the Carrel indol tumor could be transmitted in chickens by the mere injection of washed leukocytes or of blood plasma from a chicken presenting a well-developed tumor.

Teutschlaender (Zeit. f. Krebsf., Jan. 15, 1927) expresses a widely held view in the statement that conclusive evidence of an infectious causation of cancer has not yet been furnished.

**IMMUNITY.**—Various interesting findings on this subject in reference to experimental cancer have recently been published. Immunization of rats against Blumenthal's bacillogenous tumors was obtained by F. Reichert (Zeit. f. Krebsf., May 18, 1927) by injecting 0.5 c.c. of a suspension of equal parts of fresh spleen, liver and muscles of guinea-pigs in 10 parts of saline solution. After 6 or 7 weekly subcutaneous injections of this had been given, inoculation

with a virulent tumor suspension, 4 to 6 weeks after the last injection, induced growths in only 5 to 7 per cent. of the treated animals, as against 74 to 84 per cent. of the controls.

T. Lumsden (Lancet, July 17, 1926) observed that when a rat bears a Jensen sarcoma on each hind foot, the cure of 1 by injection of antiserum is invariably followed by regression of the other untreated tumor. Such a rat is absolutely immune to inoculations of Jensen sarcoma, yet sarcoma cells will grow freely *in vitro* in the rat's serum. The serum of many normal rabbits was found lethal to cancer cells and to a lesser degree injurious to normal mouse tissues.

The same observer (*ibid.*, Jan. 15, 1927) finds that the serum of an animal immunized against a homologous tumor will kill cultures of the antigenic tumor only in the presence of leukocytes appropriately conditioned, or of some secretion from the latter. Thus, any malignant cell growing in a rat is, in the absence of leukocytes, quite uninjured by antibodies present in this or any other rat's serum. Leukocytes form their special cytase only when extravasated. Partial anaërobiosis is probably the factor that determines this.

According to Pavlovsky and Widakowich (Semana méd., June 10, 1926), the eosinophiles have a marked disintegrating action on cancer, and apparently protect against cancer invasion as do the phagocytes against bacteria. Where there is much local eosinophilia in malignant disease, the clinical course is unusually favorable. In treating cancer there should be a special endeavor to enhance the production of eosinophiles.



In tar cancer in mice, J. Fibiger and P. Møller (Hospitalltid., July 15, 1926) were able partly to immunize against metastasis by subcutaneous injection of a suspension of mouse embryonal skin tissue. The treatment did not prevent the primary malignant disease, but metastases were found in only 32 per cent. of the treated mice as against 60 per cent. of the controls.

Transplantation of human cancer upon himself was attempted by Kurtzahn (Berl. klin. Woch., June 25, 1926), who caused to be transplanted pieces of a breast cancer just after their removal from a patient. Within 6 days the implants became necrotic. Homoplastic human cancer transplants evidently cause no tissue reaction exceeding that following implantation of any other foreign tissue. Possibly a transplant of cancer to another cancer patient would succeed.

**PATHOLOGY.**—A case of *epidermoid carcinoma* of the left malar region is reported by G. Y. Rusk and W. L. Miles (Amer. Jour. of Path., July, 1927) in which metastases occurred to the lungs and bones. Reaching the bones by the blood-stream, the metastases lodged 1st in the bone-marrow and then invaded the cortical bone and periosteum. An *osteosclerotic anemia*, due to widespread destruction of the marrow, was a feature of the case.

Cancer developing apparently as an *inflammation* was illustrated in a case reported by H. Nölle (Zent. f. Chir., Mar. 19, 1927). Beginning as a slight eruption on the breast, the lesion in 2 or 3 months involved the whole breast as a swollen, hard mass covered with red, edematous skin. There was no fever nor swollen

glands. Paget's disease was diagnosed through biopsy. The extent of skin involvement precluding radical operation, the condition was treated as an inflammation, and was held in check for a long time by **auto-hemotherapy** and intensive **X-ray therapy**. Erysipelas erythematousum, with a chill and high fever, then suddenly set in, with extension of the disease and itching and redness of the opposite breast. A characteristic cancer en cuirasse developed and later bone metastases occurred, with death 15 months after the beginning.

In a tumor made up practically only of cancer cells, O. Stahl and O. Warburg (Klin. Woch., July 2, 1926) determined for the 1st time by direct chemical procedures the *lactic acid production* of a human cancer (bladder). The tumor was found to produce 10 per cent. of its weight of lactic acid per hour.

From spindle-cell sarcomas of white rats Roffo and Correa (Prensa méd. Argent., Dec. 20, 1926) isolated a substance having the property of lowering the blood sugar, like *insulin*. From 8 to 12 units were generally obtained from about 500 Gm. of the malignant tissue.

According to observations by M. T. Burrows (Arch. of Int. Med., Apr., 1926), *metastases* in cancer are not the result of a simple migration of cancer cells to distant organs, but of the spread of a liquid substance from the main tumor mass. This substance, liberated through a digestion of cells in the center of the cancer, spreads over surfaces. The digestion is the result of an excess of the growth-stimulating substance—a product of the cells' oxidation. The fluid referred to is rich in growth-stimulating

substance and stimulates not only the cancer cells to grow but also the normal cells. The cancer cells, already adapted to it, respond more quickly. In their growth, they remove the nutriment and necessary substances from the other cells and destroy them.

**DIAGNOSIS.**—Among the “tests” for cancer, most attention has been paid of late to the *Botelho serum reaction*. According to Cioffari and Akkerstein (Tumori, Sept.-Dec., 1927), who compared it with a number of other tests, this reaction has much to commend it for use in suspected cancer. Lavedan (Bull. de l'Acad. de méd., May 25, 1926) states that in 111 cases of verified cancer the test was positive in 74 per cent.; in non-cancer cases, in 34 per cent. In cancers of the uterus and breast the percentages of correct results (82.5 and 85) were higher than in cancer of the skin, digestive or upper respiratory tracts. In young, healthy individuals the test was negative in 100 per cent. In non-cancerous morbid conditions it was negative in 47 per cent. The incorrect reactions were observed sometimes in pregnancy, typhoid fever, diabetes, tuberculosis and syphilis. A. L. Pimenta Bueno (Brasil-med., Oct. 1, 1927) notes that the percentage of positive results in cancer increases as cachexia tends to appear. In normal human blood the test is always negative, but dilution of the blood with water makes it positive. H. Pova (ibid., Nov. 12, 1927) had positive responses in 27 out of 35 cancer cases. It should be used in all suspected cases, particularly of internal cancer, although in early cancer biopsy is more reliable.

According to C. Mondain, R. Douris and J. Beck (Ann. de l'Inst. Pasteur,

Oct., 1927), Botelho's test represents merely a precipitation of the proteins of the serum in an acid medium by a non-specific precipitant. If the proteins are deficient the precipitation occurs; if in excess, it does not. Refractometric correction eliminates a cause of error, but changes the experimental conditions so that they are no longer exactly the same for all serums.

An improved technic for the Botelho test has been described by Hartmann (Bull. de l'Acad. de méd., Apr. 27, 1926). The 1st step is to adjust the protein content of the serum to 7 or 8 per cent. by dilution or concentration. Then 0.5 c.c. of the serum is mixed with 3 c.c. of a 1 per cent. solution of nitric acid in 0.75 per cent. sodium chloride solution. This forms, on agitating, a light foam. On this is then dripped 0.5 c.c. of a solution of 1 Gm. of iodine and 2 Gm. of potassium iodide in 210 Gm. of water. If the content remains clear the test is negative; if it becomes turbid, the test is positive. In 145 cases of cancer, it proved positive in 90.4 per cent., while in 55 patients with other diseases it was negative in 85.5 per cent. It was positive during the first months of pregnancy. It proved positive also in all rabbits with tar cancer, and negative in normal rabbits, except in one pregnant animal.

*Roffo's cancer color test*, according to his latest publication (Zeit. f. Krebsf., Mar. 20, 1926), consists in adding 5 drops of a 0.01 per cent. solution of neutral red to 2 c.c. of clear serum. The test lies in the fact that normal serum assumes a yellowish color. It is not only simple, but is also claimed to be reliable. In skin cancers, however, the positive reactions did not

exceed 30 per cent. Hilarowitz and Jankowska (Zeit. f. Krebsf., Jan. 26, 1928), recalling that Roffo had reported 63 cases of human cancer which had all given a positive reaction while 113 non-cancerous patients proved negative, were unable to confirm these results. Of 22 non-cancerous patients 17 gave a positive and 3 negative reactions, while 3 remained doubtful, 5 cases of pulmonary tuberculosis giving very marked positive reactions.

Another *color test* is that of Thomas and Binatti, who found that cancer serum containing cancer extracts rapidly discolored methylene blue. Mondain, Douris and Beck (Ann. de l'Inst. Pasteur, May, 1926) attribute this phenomenon solely to the bacteria in the cancer extracts. The Editors, however, would call attention to the labors of Mottram and Caspari, summarized under ETIOLOGY, which point to deficient oxygenation as an important factor of the cancerous process; this fact would readily explain the reduction reaction observed.

The *blood coagulation test* of Fonio was modified as follows by Bock and Rausche (Deut. med. Woch., Nov. 26, 1926): From 1 to 10 drops of a 2 per cent. solution of magnesium sulphate are, respectively, placed in 10 test-tubes. One c.c. of blood is added to each test-tube. The mixture is then well shaken and left 2 hours at room temperature. The test consists in noting the lowest number of drops of the magnesium solution which will prevent coagulation. In cancer patients the blood will almost always require more drops (about 7) than in normal subjects, whose blood will clot when less than 6 drops are

added. In some disorders, gastric or duodenal ulcer or jaundice, for instance, 1 to 3 drops will suffice to do so.

The *enzyme test* gave Balbi (Arch. di biol., May-June, 1927) the best results as compared with several other reactions tried, yielding positive responses in 20 out of 24 cases of epithelioma, and negative results in 9 cases of warts.

**TREATMENT.**—Wholesome advice is formulated by Holmes (Boston Med. and Surg. Jour., Aug. 26, 1926) when he states, in accord with many well-grounded students of cancer, that in order to get the best results, it should be studied by a group of physicians trained in various specialties and in the subject of cancer itself. Each case should be studied carefully and a definite plan of treatment decided on before initiating any therapy. Most curable cases are better treated by **surgery**, but the surgeon should not attempt a radical cure when complete removal of the tumor is impossible. These cases are better treated by radiation alone. Pre-operative radiation, properly used, probably increases the chance of surgical cure. Post-operative radiation has failed to prevent recurrence, and when prolonged has caused permanent harm to the skin.

G. E. Pfahler (Atlantic Med. Jour., Mar., 1926) does not hesitate to state that he now regards practically all cases of cancer of the skin curable if treated skillfully and thoroughly, before the growth has infiltrated the deeper tissues and involved the cartilage, bone, muscle, mucous membrane or gland. The 3 agents which have served him best are **radium**, **X-rays** and **electrocoagulation**. Ra-

dium is more intense when brought into direct contact with malignant disease and its biological effect about 3 times as great as that of the X-rays for a given amount of radiation. Electrodesiccation presents the disadvantage of creating an objectionable scar, particularly where the lesion is located on the face. It is indicated only, therefore, where the use of radium or X-rays has proved ineffectual.

Collin (Ugeskrift f. Laeger, Jan. 5, 1928) summarizes the results obtained in the 1266 non-gynecologic cases dealt with in the Copenhagen Radium Institute from 1920 to 1924. Radium was mostly used, and the X-rays in some instances. For flat *nevi*, freezing, electropuncture and photo-therapy proved most effective, but excision in pedunculated angioma. Pigmented verrucose nevi responded to radium, if treated as malignant growths. Of the 600 malignant tumors, 84 were skin cancers of the face, extensive, inoperable or presenting difficulties for operation. Of those treated with radium in the first 3 years, 72 per cent. were cured (13 per cent. of the patients were not traced). Of the 26 cases of lip cancer treated with radium in this period, 77 per cent. were cured (4 per cent. not traced). Epitheliomas resistant to repeated X-ray applications may disappear after 1 radium treatment. Radium treatment or operation is indicated on recurrence of skin cancer after one or, at most, two X-ray treatments, likewise, on recurrence of lip cancer after roentgenotherapy. X-ray treatment of the regional glands is always given in connection with radium treatment of lip cancer and seems to reduce the number of metastases. In cancer of the mouth and tongue, electrocoagulation and radium needles with roentgenotherapy seem most effective. In cancer of the esophagus, he advocates gastrostomy immediately on diagnosis, followed by intensive roentgenotherapy.

The combination of colostomy and roentgen-ray treatment is advised in difficult cases of rectal cancer. He considers radium treatment of cancer of the glans penis with roentgenotherapy of the regional glands absolutely called for.

In epulis, immediate radium treatment is indicated.

Sarcoma, which formerly resisted all curative measures, is likewise yielding in a large proportion of cases to radiation. The X-rays alone, however, give the smallest number of favorable results. Thus, while Ros-toek (Beitr. z. klin. Chir., cxli, 1, 1927), in an analysis of 142 cases treated at the Jena clinic from 1919 to 1925, obtained but 8.6 per cent. of cures with the X-rays alone, combination with radical surgical removal gave 37 per cent. of cures, the periods elapsed since treatment had ceased being from 2 to 7 years. In some instances the disappearance of the tumors was very rapid. The author, therefore, advocates excision as widely as possible, besides X-ray therapy, and urges that all inoperable cases be given the benefit of the latter form of radiation. Inoperable cases of sarcoma also yield in some instances to radium. Of 30 such cases treated by R. Ward (Brit. Med. Jour., Jan. 28, 1928) 4 had been well from 4 to 6 years, one 9 years and another 14 years. Cutaneous sarcomas without deep connections are those most frequently cured by radium alone provided full erythema dosage is employed.

Out of a series of 263 cases of cancer treated by Arce, Squirru and Nicolini (Bol. del Instit. d. clin. chirurg., Dec., 1925), radium was used in 100 instances. Of these 59 were skin cancer; 21 had been cured for 4 years to date.



Douglas Quick (Trans. A. M. A., May, 1927) advocates the use of **radium** in large amounts and intensive dosage. Failures are often due to the use of insufficient quantities and very low intensity.

Recalling that the first use of **radium** was in the superficial type of malignancy, where the results were spectacularly prompt, C. W. Hanford (Ill. Med. Jour., July, 1928) concludes that radium has a definite place in the fight against cancer, even though it is not the infallible panacea hoped for. Though a cancer that has existed over a period of months or in some cases years is not a satisfactory type to attempt to cure with radium, a satisfactory result may be expected when the cancer is of recent discovery and distinctly local in area. Once it has extended to adjacent tissues and glands, it ceases to be a local affair, which all cancers are at first, and becomes systemic. The action of radium is purely local. The rays destructive to the cancer cell do not extend their destruction in a radius of more than  $2\frac{1}{2}$  inches. Therefore the area must be circumscribed. It is probably because of the circumscribed character of cancer of the cervix uteri, and the ease of applying radium, the whole invaded territory being evenly radiated, that such signally good results are obtained in cancer in this region. When such a carcinoma is confined to the cervix and does not involve the vaginal wall, and the uterus is not fixed, heavy irradiation with radium will bring about a definite cure in a large percentage of cases.

The rules for dosage were at first empirical, but we have learned that there is a safe amount to use, while

at the same time sufficient to cause the death of the cancer cells. Formerly it was customary to allow a week between irradiations. This extended the reaction period, and was exhausting to the patient. If more than 1 application of radium is made, the interval between the 1st and 2d applications should not exceed 2 days.

#### **Glucose as an Aid to Radiotherapy.**

—Various authors having stated that glucose injections rendered carcinoma cells more susceptible to the effects of X-rays, Pfahler and Widmann (Trans. A. M. A., May, 1927), at the suggestion of Prof. Holzknecht, of Vienna, administered a 33 per cent. solution of **glucose intravenously** in 109 test cases, averaging 10 injections per patient. No evidence was discerned in support of the assumption that refractory cases were rendered more sensitive. Nor did the injections prevent the constitutional reactions, so-called.

#### **MISCELLANEOUS MEASURES.—**

According to Coley (Ann. of Surg., Nov., 1927), who bases his opinion on the end-results in 66 cases of *giant-cell sarcoma*, it is possible to cure the majority of cases of this benign form of growth by **curettage** and **carbolic acid** or **zinc chloride**, repeating the curettage if the disease recurs. If the bone destruction is sufficient to threaten pathologic fracture, **amputation** may become necessary. In several cases, however, firm union subsequently took place and the patient remained cured. Giant-cell sarcoma can also be cured by **radiation**, but the time required to attain this result is considerably longer than that required by operative treatment or by **toxins**, with or without curettage. Hence the period of disability

is prolonged. It is possible to cure benign giant-cell sarcoma, and even far advanced borderline cases (giant-cell and spindle-cell sarcoma), by injections of the **mixed toxins of erysipelas** and *Bacillus prodigiosus* without other treatment. Such a result is also obtainable by means of a combination of **toxins and irradiation** or of **toxins and curettage**. **Curettage followed by toxins**, however, requires a much shorter period of disability and is not associated with greater risk; in Coley's opinion, it is at present the method of choice.

Christian and Palmer (Amer. Jour. of Surg., Feb., 1928) observed a case of endothelial myeloma of the tibia with involvement of both bone and soft parts in which an **amputation** was done through the middle of the thigh. Metastases appeared in the femur, skull, clavicle and skin. Treatment by the **toxins of erysipelas** and *Bacillus prodigiosus* (Coley) was followed by an apparently complete recovery.

Of the various **colloidal metals** tried, the Blair Bell treatment by **colloidal lead** has received the bulk of attention. As emphasized by F. C. Wood (Atlantic Med. Jour., Jan., 1927), various difficulties limit its use to hospitals. The colloid must be made fresh every day and analyzed quickly and accurately. While the possibilities of the method are enormous, yet, at present, great care must be used. That 30 or 40 people are living who should, without it, have died 3 or 4 years ago does not mean that the cancer problem is solved. These patients should still be sent to the surgeon; radium and the roentgen ray should be used, and probably in time both of these agencies will be combined with the employment of some form of lead.

Ullmann (Surg., Gyn. and Obst., Jan., 1928) employs solutions of **lead orthophosphate** which keep indefinitely at room temperature and apparently do not alter their toxicity with age. He does not believe that lead should, at present, take the place of the time tried methods of surgery and radiation, but should be reserved for those unfortunates who are beyond the reach of either. It is necessary, in order to obtain the maximum benefit, to combine the roentgen ray or radium with the lead injections, and therefore absolutely essential that the user be not only a good clinician but a radiologist as well, or be in close operation with a competent radiologist.

In a series of 14 malignant tumors, 8 of the uterus, 4 of the breast and 2 of the skin, 3 showed softening after the 2d or 3d injection, according to A. Kaemmerer (Deut. med. Woch., Jan. 27, 1928). Two patients had a slight renal irritation. There was decrease in the number of neutrophils with a stationary leukocyte count. The lymphocyte count rose.

The present status of the method is perhaps best interpreted by the observations of Stone and Craver (Ann. of Surg., Sept., 1927). They observed regressive changes in the tumors of 8 patients out of 21 who had received **lead injections**, either alone or in combination with the applications of the **X-ray** and **radium**. In 2 cases, however, the changes were transient, and did not exert any influence on the course of the disease. In 1 of these—a cancer of the breast—there was a definite regression of the primary tumor shortly after the injections of lead alone, but the lead had no apparent effect on the metastases or on the course of the disease. The other, also a cancer of the breast, showed regressional changes in the skin metastases where the X-ray had been applied previously, but manifested

no other changes. In malignant osteogenic sarcoma, lead in conjunction with irradiation offers a valuable method.

E. H. Ochsner (Int. Jour. of Med. and Surg., Mar., 1927) obtained encouraging results in 5 cases of inoperable cancer with **colloidal gold**,  $\frac{1}{1000}$  grain to every 10 minims of water, taken in a half wineglassful of water 1 hour before each meal and increasing by 1 drop daily up to tolerance, *i.e.*, slight gastro-intestinal irritation, colicky pains and tenesmus. Some patients, however, were able to reach 60 drops per dose. Where the malignant tumor is within reach, the solution is also applied locally. Hieger (Biochem. Jour., xx, 217, 1926) noted that in the rat the administration of **copper** with the food appeared to check in some instances the growth of carcinoma.

In a test conducted to ascertain the value of colloidal gold, copper and lead, Soiland, Costolow and Meland (Radiol., June, 1927) obtained rather discouraging results, colloidal lead alone showing apparent improvement.

Fitzwilliams (Brit. Med. Jour., Apr. 23, 1927) used **colloidal lead**, the preparation containing 0.2 per cent. of lead iodide, in 60 cases, and concluded that this mode of treatment could not replace operation. But after removal of the growth as widely as possible, lead injections would prove useful to eliminate small foci in the internal organs and tissues.

As previously stated (see ETIOLOGY), Ellice McDonald, having in view an increase of cell-membrane permeability and conductivity to favor cell division, recommends bivalents, especially calcium to aid radiation, as furnished by radium and the X-rays. In a recent paper the same author recommends **calcium** internally and

also **parathyroid gland**, which tends to favor calcium metabolism.

**CARBON MONOXIDE.**—In a study of the effect of carbon monoxide on *metabolism*, Walters (Amer. Jour. of Physiol., Mar. 1, 1927) found that the metabolic rate is depressed to a degree varying directly with that of saturation. The body temperature declines at a rate closely corresponding to the slowing of the metabolic rate. In the rat, breathing carbon monoxide in concentrations of 0.02 to 0.05 per cent. for 1 to 2 hours had little or no effect on the metabolic rate, but for 4 to 6 hours it depressed the rate in individual cases. Concentrations above 0.05 per cent. markedly depressed the rate, even with only short periods of exposure.

**POISONING.**—The symptoms are divided by R. R. Sayer, W. P. Yant and W. J. McConnell (Atlantic Med. Jour., Nov., 1925) into 2 stages. In the 1st there is a feeling of tightness across the forehead, dilatation of superficial vessels, frontal and basal headache, throbbing in the temples, weariness, weakness, dizziness, nausea and vomiting, loss of strength and muscular control, increased pulse and respiration rates, and collapse. All of these symptoms are greatly increased and accelerated by exercise on account of the need of additional oxygen in the tissues. The 2d stage exhibits increased pulse and respiration rates, fall of blood-pressure, loss of muscular control (especially the sphincters), loss of reflexes, coma, usually with intermittent convulsions, irregular respiration, slowing of the pulse, slow and shallow respiration, cessation of respiration and death. The number of symptoms decreases with the rate of saturation. With high concentrations there may be only a few symptoms, such as weakness and dizziness. If a given saturation has been acquired by long exposure to a low concentration, the symptoms and after-effects will be much more severe than if it has been acquired by a short exposure to a high concentration. The after-effects of poisoning range from practically none to headaches, muscular pains, long periods of unconsciousness, loss of strength and mental derangement, such as loss of memory, paralysis

and temporary blindness. In early cases all these clear up in a day or 2, but they have extended over months.

In an *infant* showing torpor, subnormal temperature and a history of vomiting and failure to gain, one should question the mother, as stated by A. M. Stevens (Jour. Amer. Med. Assoc., Apr. 17, 1926), concerning the use of gas in the home and the amount of fresh air the baby has been getting. Such symptoms may be due to the inhalation of small amounts of carbon monoxide from a badly burning stove or leaky gas appliance. In *older children*, there may be produced slight jaundice with attacks of vomiting, general pallor, headache, breathlessness, dilatation of the veins of the neck, hemic murmurs, enlarged spleen, anemia and albuminuria. In a fatal case in an infant, the writer made use of a simple qualitative test for carbon monoxide in the blood, as follows: Three drops of blood from the infant's heel were dropped in 5 c.c. of water and shaken to a uniform pink. The same was done with 3 drops of control blood from the physician's finger in another test-tube. A drop of 5 per cent. sodium hydroxide solution was then added to each tube. The solution of blood from the infant remained a clear pink while the control solution turned to a dirty green color. This showed at least 10 per cent. of carbon monoxide in the infant's blood, thus confirming the previous tentative diagnosis of carbon monoxide poisoning, based on the peculiar combination of marked circulatory failure with a bright pink flush.

A case of *Parkinsonism* with unusual degenerative change—myelinopathy—in the cerebral white matter has been described by Grinker (Jour. of Nerv. and Ment. Dis., July, 1926). The pathogenesis of carbon monoxide poisoning consists probably of an initial vascular paralysis followed by asphyxia of structures having a relatively poor capillary supply. There is a definite somatotopic organization of the globus pallidus.

According to E. D. Wilson, I. Gates, II. R. Owen and W. T. Dawson (Jour. Amer. Med. Assoc., July 31, 1926), there is a definite risk of carbon monoxide intoxication in *foot traffic policemen* doing 8 hours' duty in the crowded section of a city. Values of 0.9 to 2.28 per cent. by volume

of carbon monoxide and saturations of the hemoglobin with it of 5 to 13 per cent. were found. From 8 hours of maximal exposure, up to about 30 per cent. of the hemoglobin may possibly be temporarily saturated with carbon monoxide. At about 30 per cent. saturation, slight increase of pulse rate, deeper breathing and slight palpitation became observable during rest, and running upstairs was followed in about  $\frac{1}{2}$  minute by dizziness, dimness of vision and abnormally increased pulse rate.

**Treatment.**—The normal elimination of carbon monoxide from CO-hemoglobin is too slow to obviate serious effects, as noted by Sayer, Yant and McConnell (*loc. cit.*), hours being required to reduce the CO-hemoglobin to 10 per cent. of the total hemoglobin. The process may be accelerated, however, by (1) increase of oxygen in the pulmonary air and plasma, benefit resulting through mass action, and (2) increase of the lung ventilation, which will remove faster the CO given up by the blood to the lungs. A mixture of 5 per cent. of **carbon dioxide with oxygen** will remove the CO 5 to 6 times as fast as normal air.

For the effective treatment of a case of acute CO poisoning: (1) The victim should be at once removed to **fresh air**. (2) If breathing has stopped or is weak or intermittent, **artificial respiration** by the **Schaefer method** should be given persistently until normal breathing is resumed or the heart has stopped. (3) **Oxygen**, or the mixture with 5 per cent. of **carbon dioxide**, should be begun promptly and continued at least 20 minutes in mild cases and as long as 1 to 3 hours, if necessary, in severe cases if the patient does not regain consciousness. (4) Circulation should be aided by **rubbing the limbs** and keeping the body warm with **blankets, hot water bottles, hot bricks**, etc., care being taken that hot objects are wrapped and do not produce burns. Hypodermics of **caffeine sodio-benzoate** or **camphor in oil** should be given only by a physician after he has considered the possibility of collapse following excessive stimulation. (5) **Rest in recumbency** to avoid strain on the heart is indicated. Later the patient should be treated as a convalescent and given ample time to recuperate.



In therapeutic experiments in dogs, D. C. Walton, M. S. Allen, W. A. Eldridge and M. G. Witherspoon (Arch. of Int. Med., Mar., 1926) found **oxygen plus 5 per cent. of carbon dioxide** most effective of 5 treatments tried. Taking a reduction to 25 per cent. saturation of the blood as a desirable point to be reached as quickly as possible, this point was found to be reached in 12½ minutes with the mixture referred to, as against 29 minutes with air and 5 per cent. carbon dioxide and over 50 minutes with air alone. As the difference in results between oxygen alone and oxygen plus carbon dioxide was slight, and since oxygen is more readily available, it is recommended that the use of the latter be continued in localities where transportation is difficult.

**CARBON TETRACHLORIDE.**—Previous to the introduction of carbon tetrachloride, *pregnancy* was regarded as a contraindication to anthelmintic treatment, *e.g.*, with thymol, oil of chenopodium, or betanaphthol. Administering carbon tetrachloride to 219 pregnant women, however, J. V. Insfran (Jour. Amer. Med. Assoc., Mar. 13, 1926) witnessed no unfavorable symptoms during the 4 days following the treatment, nor any case of abortion attributable to the drug. Pregnancy need no longer be considered as a contraindication to anthelmintic treatment in areas where *Necator americanus* is the offending agent and carbon tetrachloride the drug used. The use of a mixture of oil of chenopodium and carbon tetrachloride in areas where *Ancylostoma duodenale* predominates may be possible.

**POISONING.**—The number of deaths from the use of carbon tetrachloride in **hookworm disease** has been extremely small. It appears that the dose of the drug given has little to do with its toxicity. Large doses, such as 10 to 15 c.c. (½ to ½ ounce), given to thousands of patients, have not been found to cause any more symptoms, nor to be any more effective than doses of 2.5 to 3 c.c. (40 to 48 minims). Yet adults have died after taking 1.5 c.c. (24 minims), and children after taking 0.18 to 0.92 c.c. (3 to 15 minims). P. D. Lamson, A. S. Minot, and B. H. Robbins (Jour. Amer. Med. Assoc., Feb. 4, 1928) present

important data on various aspects of the prevention and treatment of carbon tetrachloride poisoning. Carbon tetrachloride given alone to persons heavily infested with **ascarids** may cause severe symptoms as a result of increased activity of the worms. Respiratory and intestinal obstruction have thus been observed. Removal of the roundworms with chenopodium several days before giving the carbon tetrachloride will lessen this danger. Chronic alcoholic addicts should be refused treatment with this drug. The taking of *alcohol* or *food* with or for several hours before or after administration of the drug should be avoided. *Calcium deficiency* has been shown by the writers to be another cause of carbon tetrachloride intoxication. An adequate calcium reserve should be insured in all persons treated. Most normal adults and children have such a reserve, but in poorly nourished children a reserve should be built up routinely before treatment. The total daily adult requirement of calcium can be furnished by adding to the diet about 1 quart of **milk**. In the absence of milk, the same result is obtainable by feeding **calcium lactate**, **carbonate** (chalk) or **chloride**, 45 grains (3 Gm.) daily in divided doses for about 1 week before the treatment. The symptom-complex of carbon tetrachloride poisoning due to calcium deficiency, which the writers have observed in dogs, and which would probably be the same in man, begins with depression and vomiting. The vomitus may be blood-tinged, and gastrointestinal hemorrhages may occur. Fine tremors, which may pass into clonic convulsions, are common. Jaundice may or may not be apparent. The typical death is by exhaustion or hemorrhage. The treatment of such poisoning consists in giving **calcium salts** by the mouth. **Intravenous injection of calcium chloride** is justified only in patients already moribund. **Ammonium chloride** or **hydrochloric acid** orally is also effective in making stored calcium available. If excessive nausea is not produced, any of these drugs can be given in frequently repeated doses until relief results or signs of air hunger warn of acidosis. **Parathyroid extract** subcutaneously is effective when other drugs cannot be retained. Doses are given at intervals of

several hours. Since its effects set in only after 6 to 8 hours, an acute case requires calcium treatment in addition.

**THERAPEUTICS.**—The following method of administering carbon tetrachloride has been found very satisfactory by the above-mentioned authors: The patient may eat the usual evening meal the night before treatment. At 7 A.M., on a fasting stomach, 3 c.c. (48 minims) of carbon tetrachloride in freshly prepared, hard gelatin capsules to an adult. The dosage for children follows Young's rule. At 9 A.M., magnesium sulphate, 30 Gm. (1 ounce), is given, dissolved in 250 c.c. (8 ounces) of water. At noon, a light lunch of broth, bread and coffee may be taken. Carbon tetrachloride has been found in practice to remove 95 to 100 per cent. of the worms in patients infested with *hookworm* (*Necator americanus*). It is somewhat less effective with *Ancylostoma duodenale*.

**CARBUNCLE.**—In small superficial carbuncles and in some large carbuncles, including those of the face, according to L. Carp (Ann. of Surg., Nov., 1927), **X-ray** treatment as an aid to conservative therapy—**poultices, carbolization**—has given good results. If, however, improvement does not occur in 3 or 4 days, other measures, *viz.*, **surgery or circuminjection of autogenous blood**, are indicated. In large carbuncles, diabetic or non-diabetic, the treatment of choice is **radical surgery**. In *diabetic* carbuncles, prompt establishment of free drainage is essential in order to prevent spread of infection. X-ray treatment without surgery is contraindicated.

The same observer (*ibid.*, Apr., 1927) has reported 12 cases treated by **circuminjection of autogenous blood** without other operative procedure. No reaction followed the injection. The blood was obtained from the median basilic vein. As a

result of the treatment the infection stopped spreading, except in 1 instance, and there was rapid relief from pain and constitutional symptoms. The blood injected seemed to stay in the tissues, with gradual modification, for several days to 2 weeks, as indicated by local induration, ecchymosis or both. Most of the slough liquefied. All the cases showed a minimal scar. The writer regards the procedure also as a valuable adjunct in accessible spreading infections treated by any other method.

According to W. E. Lee and T. McK. Downs (South. Med. and Surg., July, 1927), the crucial incision alone in carbuncle is inadequate, and complete incision is more radical and mutilating than is necessary. The special mechanical factor in the regions where carbuncles occur is a tough skin connected with the underlying fascia by strong vertical septa. This not only delays the breaking of the focus through the skin but forces it to extend laterally and become pocketed in the honeycomb-like area. The treatment advised consists in the relief of tension and the removal of dead tissue. The involved area is divided into 4 sections by a **crucial incision** extending well beyond the indurated area in all directions. Each flap is then undercut with a sharp knife parallel with the skin and about midway between the skin and the deep fascia. These incisions also extend beyond the periphery of the indurated area. Gauze soaked in some germicide is packed under each flap and removed after 24 to 48 hours. The dead tissue sloughs within 6 or 7 days at the most, and the flaps are then allowed to fall into the wound,

to be held by adhesive straps or secondary sutures.

E. M. Livingston (Ann. of Surg., Nov., 1926) describes a treatment featured by rest through **immobilization** and a plastic type of operation. The immobilization is secured with a **plaster-of-Paris dressing**. The **plastic operation** consists of a **double crucial incision** with excision of a small central portion and the formation of 2 sliding lateral flaps, planned to cover completely the denuded area caused by loss of necrotic tissue. The total time of treatment is asserted to be reduced by 50 to 75 per cent. as compared to other methods. The time ordinarily taken up by dermatization is saved, cervical deformity is minimized, and in favorable cases a scar consisting of straight lines results.

In cases of *facial carbuncle* Bailey (Surg., Gyn. and Obst., Apr., 1928) advocates **ligation of the angular vein**. Among 15 cases of thrombophlebitis of the cavernous sinus he had found 4 due to a furuncle or carbuncle of the upper lip and 3 to an infected gnat-bite of the nose. The angular vein, linking the venous radicles of the upper lip and the ophthalmic plexus, constitutes a main channel by which infection passes into the venous system. In 3 cases the writer ligated this vein in order to forestall spread of the infection.

**Intravenous injections of horse serum** were used by F. G. Kee and J. Santillan (Jour. Philip. Isl. Med. Assoc., June, 1926) in 11 cases of carbuncle or furuncle. Usually, 24 hours after the 1st injection the edges of the wound become inflamed; after the 2d the inflammation subsides, any fever present drops, and a sharp line of demarcation forms between the sound and dead tissue. Later the slough falls off, leaving a healthy

granulating cavity, to which **balsam of Peru** is applied daily. Pain is usually relieved in 48 hours after the 1st injection. Slight weakness, dizziness and nausea may follow the injection, but subside in 10 to 15 minutes. Occasionally a brief febrile movement was observed.

According to F. M. Hodges (Jour. Amer. Med. Assoc., Oct. 24, 1925), the **X-ray** acts almost as a specific in most carbuncles, when the inflammation is confined to the skin and subcutaneous tissues. Generally pain is relieved, drainage enhanced, and recovery hastened. Deep-seated, well-developed carbuncles on the back of the neck responded nearly as well. In 2 early cases no benefit appeared to follow the treatment.

The **d'Arsonval bipolar current** is recommended by A. D. Willmoth (Ky. Med. Jour., Aug., 1927). The d'Arsonval terminals of the high frequency machine are used because the voltage is low and the milliamperes high. Preferably, a machine which does not oscillate more than 1 million times per second should be employed. Where the area involved is not too great, it can be anesthetized by the same current as is used in operating. The indifferent electrode is attached to any convenient part of the patient's body, or, the autocondensation handle may be used, the patient grasping it firmly with both hands and the indifferent cord being attached to it. The active needle-point electrode is used at first with a very light current—just enough to make the so-called feather spark—which is allowed to come in contact with the skin about  $\frac{1}{4}$  inch or a little more from the margin of the area to be destroyed. By passing this in a circular manner

around the carbuncle for 3 to 5 minutes, gradually increasing the spark to the point of tolerance, and at the same time increasing the speed of the revolutions, one can numb the entire area, and without telling the patient, the needle is pushed into the infected tissue as deep as is necessary to reach the deepest points of infection and allowed to remain there, the current being increased, if needed, until the tissue is blanched white. The amount of current needed is usually about 250 to 500 milliamperes and the time 20 to 30 seconds. When the tissue becomes white, the needle is removed and inserted into another adjoining area and the current applied with the foot switch until the tissue is again blanched. By repeating this procedure, one can destroy the diseased area in a few minutes, and only healthy tissue will remain. When all infected tissue is coagulated, the major portion can be removed at once with a large spoon curet, only a healthy base being left. Any bleeding points are controlled by allowing the current to arc for  $\frac{1}{2}$  inch spark distance, when all bleeding will instantly stop. The wound is now clean and ready to be dressed with plain sterile gauze. Pain is not experienced after the treatment, because the nerve-endings have been obtunded by the current.

The writer generally operates under narcotic anesthesia with the patient in a profound or twilight sleep. If ether is used, great care must be exercised to prevent explosion. If local anesthesia is employed, at least  $\frac{1}{3}$  less current should be used. Where the slough produces much odor, this is easily cared for by the application of powdered **sugar** moistened enough to

form a paste and spread on gauze. Separation of the slough is hastened by the use of **pepsin**, which will digest all tissue destroyed by the current, leaving a clean granulating wound. Scarring is lessened and healing accelerated by the use of the water-cooled **ultra-violet lamp**, 1 to 2 minutes daily, with open lamp at 6 inches' distance. The use of **hydrogen peroxide** to cleanse the wound will enhance the therapeutic action of the lamp.

According to C. L. Hustead (Arch. of Physical Ther., Jan., 1928), in beginning carbuncle, treatment with **radiant heat** and the **ultra-violet ray** will in many cases prove to be abortive. He exposes the carbuncle and a wide margin beyond it to the radiant heat lamp, the rest of the body being covered by towels. The light is started at about 24 inches' distance and every few minutes lowered an inch or 2 until the patient complains of the heat, at which point it is held for  $1\frac{1}{2}$  hours. An occasional stroking with gauze relieves the patient of the sensation of heat. Next the ultra-violet ray is applied with the water-cooled lamp under compression for 1 or 2 minutes, and then a sterile dressing. Under this treatment applied daily, the usual case will be on a reparative instead of a destructive course about the 5th day. In cases seen only in the 2d stage, with firm dense infiltration of the deeper skin and subcutaneous tissue, and the overlying skin showing a reddish tinge, the radiant heat lamp is used as before, but the ultra-violet ray dosage is increased daily as rapidly as the skin reaction will allow, in conjunction with the **X-ray** in divided doses with the following setting: S. G., 7," 2 ma., sole-leather



filter, 1 mm. of aluminum filter, 10 inches' distance, 3 minutes daily for 10 days. In 2d-stage carbuncles this procedure will nearly always bring a more speedy cure than surgery, and gives a far better cosmetic result. In 3d-stage cases, with softening and breaking down of the skin, if X-ray treatment has been used, the cavities show granulations and the general condition is good, sterile dressings moistened with **Dakin's solution** usually suffice for complete healing. In cases with sloughing of the whole mass and grave constitutional symptoms, **excision** is indicated. The writer 1st penetrates the skin with a sharp scalpel beyond the margin of skin necrosis and then removes the whole carbuncle and slough with the **electric cautery**. The wound is treated daily with the **radiant heat lamp**, a sponge being used to absorb the serum as it appears, and sterile dressings moistened with Dakin's solution applied, the healthy skin being protected with plain vaseline. In 2d-stage carbuncles in diabetes unresponsive to diet and insulin, the writer likewise excises the lesion at once, except where severe facial disfigurement would result.

In the *diabetic* cases unresponsive to insulin alone Walke (*ibid.*) 1st gives 500 c.c. of **glucose solution intravenously** and injects the **insulin** 15 minutes later. The blood sugar and urine sugar then drop considerably. Locally he uses the **infra-red rays** for 45 minutes and if no sugar is shown employs the **ultra-violet rays** daily to overcome calcium deficiency, believing that the latter plays a part in carbuncles. After the carbuncle has broken down, **puncture** of a small head pointing with a scalpel gives

great relief. The ultra-violet rays are then used at 12 inches' distance with the area 2 or 3 inches around the wound covered.

A case of *carbuncle of the kidney* is reported by T. Thompson (Lancet, Oct. 1, 1927). The patient had had a carbuncle of the neck about 1 month before, which had healed after incision. While convalescing she bumped her left loin and 10 days later was seized with severe pain in the left side, fever and malaise. Eventually rigidity and marked tenderness appeared, with an ill-defined swelling deep in the left loin. The urine was normal. The X-ray showed an ill-defined shadow in the left loin. At operation a perinephric abscess was found and drained, and the lower pole of the kidney found bulged out by an ill-defined hard swelling. Nephrectomy was performed and the wound drained. The pus yielded *Staphylococcus aureus* in pure culture.

**CARDIAZOL.**—This is a synthetic compound having the formula  $C_5H_{10}CN_4$ , and is offered as a heart stimulant free of certain disadvantages of camphor in oil. It is chemically pentamethylentetrazol, combining the nitrogen-containing tetrazol ring with the pentamethylene group. It is not related to the volatile oils of the terpene group, and differs considerably from camphor in its formula. The compound occurs as a white crystalline powder, odorless, almost tasteless, and extremely soluble in water, in which it forms a neutral and stable solution. The dose is  $1\frac{1}{2}$  grains (0.1 Gm.) subcutaneously or intravenously. One or 2 tablets of this amount may also be taken by mouth several times a day. Absorption after subcutaneous injection is stated to be very rapid, Pichler finding it thus active in 4 to 6 minutes and after oral use in 7 to 10 minutes. It is stated to be non-irritating, with a high margin of safety, and free of cumulative action.

The drug has been reported useful by several observers, mostly European, in acute cardiovascular **collapse** as well as in **chronic circulatory weakness**, as a stimulant to the respiratory center and circula-

tion in pneumonia, in auricular fibrillation and angina pectoris, and as a pre-operative prophylactic heart stimulant. It may be combined with digitalis, theobromine and other cardiants. According to G. L. Waldbott (Med. Jour. and Rec., June 16, 1926), on the frog heart damaged by chloroform it increases the amplitude of the cardiac contractions while diminishing their rate. In a heart previously intoxicated by strophanthin it regulates the rhythm. It stimulates the medullary centers and thus increases the blood-pressure. In 3 cases in which this author employed cardiazol clinically, almost immediate and striking results were witnessed.

Experimental results less favorable to the drug have, however, been reported by R. W. Whitehead and W. B. Draper (Colo. Med., July, 1927). In 25 experiments on cats and dogs and 7 on normal human subjects no action on the blood-pressure or respiration was brought to light which would indicate that cardiazol is likely to be of value clinically. The most favorable action that occurred with any degree of constancy, *viz.*, that of stimulation of respiration, could be produced with less dangerous side-effects by some such drug as alpha-lobeline. The initial fall in blood-pressure, which is its most constant action on the circulatory system, might prove dangerous in badly shocked patients. The favorable action on auricular and ventricular contractions and on blood-pressure was too uncertain, brief and insignificant to warrant its use as a cardiac stimulant. The drug seems to be especially likely to produce convulsions, and even when they do not appear it produces hyperirritability, tapping sharply on the table resulting in a brief spasm.

**CATARACT.**—According to Duke-Elder (Lancet, June 26, 1926), the primary cause of cataract generally is probably to be associated with the direct action of incident radiant energy of any wave-length on the lens, increasing the lability of its colloidal system and deranging the autoxidation system on which its metabolism depends. This renders

its proteins more prone to coagulation by changes in the hydrogen ion concentration or in the salt content, osmotic changes determined locally by the action of radiant energy on the lens capsule or by general metabolic disturbances, and by possible continuous photosensitization.

Five cases of *juvenile cataract* apparently of endocrin etiology are recorded by V. Grönholm and C. M. Hohenthal (Finska Läk. Handl., Nov., 1927). In all of the cases, ranging in age from 13 to 32 years, there were clinical endocrin disturbances in association with a rapidly developing bilateral cataract. Vision was restored by surgical treatment, except in 1 eye in which there were complications after operation.

L. Jacques (Amer. Jour. Med. Sci., Feb., 1928) reports 2 cases of bilateral cataract developing in the course of *post-operative tetany*, and tabulates 34 such cases from the literature. The need of prompt, adequate control of post-operative tetany to avoid such complications is emphasized.

**TREATMENT.**—According to J. F. Fulton (Jour.-Lancet, Nov. 15, 1926), 60 per cent. of all cases of incipient opacities can be checked, improved or cleared up by the treatment he describes. The patient is given a 1:1,500 solution of **mercury cyanide** to be dropped into the eye 3 times daily. This stimulates the lymphatic circulation. The writer also applies a stronger solution of the same remedy, rubbing it into the posterior folds of the conjunctiva, together with a solution of **adrenalin**. The latter seems to have a powerful therapeutic effect in these cases. Occasionally, in obstinate cases, it is necessary to inject the cyanide solution under the con-

junctiva or into the orbit structures. This treatment is continued for 2 weeks at a time, the patient then returning after a month's interval, when the treatment is resumed, according to lens conditions. Previous to the treatment any existing septic focus or constitutional condition that may be a factor in the opacities should be looked for.

According to Borsch (Rev. gen. d'opht., xxxix, 246, 1925), cataract is often due to absorption of toxic material from the alimentary tract. Refractive errors, leading to continuous slight congestion, also predispose to it. Aside from proper **refractive correction**, the use of glasses to filter out any irritant rays, and proper treatment of the gastrointestinal tract, teeth and tonsils, he orders **douching** of the eyes with an antiseptic, astringent and stimulating solution. Such treatment often causes incipient opacities to disappear and retards presbyopia.

The **lens-antigen treatment** of cataract—a form of protein therapy—is recommended by A. E. Davis (Amer. Med., June, 1926) on the basis of 5 years' experience in clinical cases. The lens-antigen is prepared from beef lenses, 5 of which are broken up and macerated in 100 c.c. of salt solution containing 0.5 per cent. each of sodium bicarbonate and phenol. The protein content of the resulting solution is about 2 per cent. A preliminary sensitization test is made by injecting 4 or 5 drops of the solution intracutaneously in the patient's forearm. If the reaction is very marked, the therapeutic injections of lens-antigen are given cautiously and in small dosage until the patient becomes desensitized. The initial therapeutic dose, given

subcutaneously, is generally 0.5 c.c. Thereafter the dose is increased by 1 c.c. each time in vigorous patients, or by 0.5 c.c. in women or feeble patients. Daily injections are given, up to about 8 c.c. in women and 10 c.c. in men. Where slight dizziness, restlessness, pain in the back or stomach, or nausea, is complained of shortly after an injection, the dose is reduced 1 to 2 c.c. and held at that for a week or 10 days before resuming a gradual increase to toleration. Fifty doses, extending over about 2 months, constitute a course of treatment. During this time the patient takes **potassium iodide**, 10 to 15 drops of the saturated solution in a full glass of water at meal time, or, if not well tolerated, **syrup of hydriodic acid**, 1 teaspoonful in a little water  $\frac{1}{2}$  hour before meals. The patient is also instructed to have as nearly a **salt-free diet** as possible. Local reactions are at times considerable, especially toward the close of the treatments.

In over 250 cataractous eyes treated, the cataracts were *checked* in 85 per cent. by this method. In 71 cases with bilateral cataract, the less advanced cataract was arrested and *improved* in 50.70 per cent. of the cases; the improvement in the 2 eyes was equal in 33.80 per cent. of the cases, and the more advanced cataract was improved in only 15.74 per cent. of the cases, these figures emphasizing the need of *early* diagnosis and treatment. All presbyopes should be carefully examined for beginning cataract, and if such is found, should be informed of the fact and advised to undergo early treatment to preserve their vision. The lens-antigen is most effective in the ordinary senile subcapsular cataract, while it has

little or no effect on the nuclear type. It is effective in zonular and congenital cataracts, and in diabetic, traumatic and membranous cataracts with inclusions of cortical matter. The treatment is advantageous as compared to operation in the avoidance of loss of accommodation and of heavy glasses, in that useful vision is maintained without the interval required for the patient to become almost blind before operation, and in that the lens-antigen has a general tonic effect. In the few cases of cataract not arrested by the treatment, the operation is made more safe in that the patient has been desensitized to lens-albumin, thus avoiding a cause of occasional severe post-operative inflammation.

According to W. J. Kerr, G. N. Hosford and H. C. Shepardson (Endocrinol., Mar.-Apr., 1926), **thyroid** is of value in early senile cataract. They also use **iodides locally** in the eye. Of 28 cases thus treated, 10 showed improvement, 10 were unchanged, and 8 became worse. These were mostly advanced cases, in which not much improvement could be expected. Results should be better in incipient cases.

Michail and Vancea (C. r. Soc. de biol., Jan. 14, 1927) observed a markedly increased resistance to naphthalinic cataract in rabbits upon administration of insulin. Beginning lesions in the lens were dispelled by the drug. The clinic course of some senile cataracts and the course of cholesterolemia in these cases suggest an analogy with naphthalinic cataract. At least some senile cataracts may be of pancreatic origin.

Regarding **operative treatment**, J. O. McReynolds (Jour. Amer. Med. Assoc., Jan. 7, 1928) believes patients can now be told that an operation

may be successfully performed at any time when the opacity of the lens has reached such a stage as to prevent the patient from following his usual occupation. In operating, the zonula can be successfully ruptured without rupture of the capsule or the anterior hyaloid membrane, and the lens thus extracted in its entirety with considerable certainty in practically all patients after the age of 50. The procedure is possible, but with difficulty, in the 4th decade, while in the 3d decade it is almost impossible. Thus, the procedure may be said to be applicable with relative certainty after the age of 45, while prior to this age a **capsulotomy** operation, together with a partial extraction, will offer the best means of securing vision.

W. R. Parker (Trans. Amer. Med. Assoc., May, 1927) has reported on 300 cases, comprising 100 each, dealt with by the **combined, simple and Knapp-Torok** methods of **extraction**. Loss of vitreous occurred in 4 per cent.; spontaneous hemorrhage, in 0.33 per cent.; prolapse of the iris, in 3 per cent.; infection, in 0.66 per cent.; cataract delirium, in 1.33 per cent., and secondary glaucoma, in 0.66 per cent. The average astigmatism resulting from the combined operation was 2.6 per cent.; from the simple operation, 1.9 per cent., and from the Knapp-Torok operation, 2.6 per cent. Secondary cataract occurred in 14 per cent. after the combined and in 30 per cent. after the simple operation, and a dense membrane formed in 3 per cent. after the Knapp-Torok operation.

**Extraction of the lens entire** in its capsule **without iridectomy** is endorsed by D. S. Khanka (Practitioner, May, 1927). A sclerocorneal incision ex-



tending about  $\frac{1}{3}$  the circumference is made, with as little cornea as possible left near the base of the iris. The entire iris is pushed out by the outcoming entire lens, and it spreads itself over the sharp edge of the inner margin of the cut cornea like a blanket, so that the sharp edge cannot cut the capsule in its outward journey, and thus helps the removal of the lens entire in the capsule. There is no chance of the iris being caught in the corners of the corneal incision, as occasionally occurs where the iris is cut. At the close of the operation the corneal flap is raised slightly to make sure that the iris is snugly lying flat on the surface of the vitreous, without any tendency to prolapse, and the eye is shut and bandaged. The patient is made to sit up and not lie down for 6 hours, as the former position has been found in practice to oppose prolapse of the iris.

Regarding **facoerisis**, or the intracapsular removal of the lens with a suction apparatus, W. A. Fisher (Ill. Med. Jour., Feb., 1927), after experience with 2500 eyes, concludes that this, if properly done, seems to be the best operation for all kinds of cataracts except dislocated lens, but it must be emphasized that the method is not as simple as capsulotomy. Post-operative inflammation seldom follows, and detention in the hospital is reduced. The technic is facilitated by practice on chickens' lenses. The operator should be familiar with the Smith operation, for its use is generally quite necessary if a complication occurs during facoerisis, *e.g.*, slipping of the suction instrument from the lens after the latter has been dislocated, excessive contraction of the pupils after the incision, or blood

in the anterior chamber obscuring the pupil. A conjunctival suture seems desirable, but it is not a simple procedure.

The question as to whether to operate upon more than 1 eye in an old person is a debatable one, according to M. Black (Colo. Med., July, 1927). Aged people do not bear any kind of an operation well, and if the operation upon 1 eye is successful, the writer's advice is to let the other eye alone. A person can see to read and get about almost as well with 1 eye as with 2. Stereoscopic vision is difficult to acquire when both eyes have been operated upon, and unless the patient is in the fifties it is not worth while to subject him to 2 operations. Operation upon both eyes at the same time is inadvisable; it is better to have the experience with 1 eye for guidance in the management of the other. In a *diabetic* requiring cataract extraction the blood sugar should be estimated and the patient placed on **insulin** in appropriate doses until the blood sugar is down almost to normal. Weeks of insulin treatment are required before the operation will be safe.

After experience in 1500 cataract operations, G. H. Bell (Med. Jour. and Rec., May 19, 1926) asserts that post-operative infection in eye surgery is preventable by the following means: **Focal infections**, such as oral sepsis, diseased tonsils and enterogenous toxemias, must 1st be **removed**. This work is to be done 2 to 3 months before the patient is admitted to the hospital. A Wassermann test is made in zonular and complicated cataracts, as well as in all **senile** and **juvenile** cataracts. The urine is examined several times before the operation,

and the blood-pressure must be known. **Castor oil** is given 24 hours before the operation. One hour before operation a smear of the conjunctival sac is taken, and 2 drops of 1 per cent. **silver nitrate** solution are then instilled into each eye. This produces an irritation—but not inflammation—of the conjunctiva which induces leukocytosis and promotes phagocytosis and antibody formation. The brow, eyelids and adjacent skin are washed thoroughly with **castile soap and water**, and the eyes are then washed out with normal **salt solution** to remove mucus, dust, etc. While the eye is undergoing cocaineization it is bathed continuously in fresh 25 per cent. **argyrol** solution, *i.e.*, every time a drop of cocaine solution is used in the eye a drop of the argyrol is instilled.

In unruly patients requiring cataract extraction R. E. Wright (Arch. of Ophth., Nov., 1926) advocates **blocking of the facial nerve**, which he has carried out in 150 cases with good results. The lobe of the ear is pulled forward and upward and the needle introduced at about the level of the mastoid process. Paralysis results in 5 to 15 minutes. The side of the face becomes mask-like and the pressure on the globe is limited to that caused by the levator muscles or a bulging eye. The only disadvantage is the resulting lagophthalmus which in 4 cases persisted so long that a tarsorrhaphy became necessary. The lids must be carefully approximated during the application of the dressings.

In *congenital cataract*, according to L. W. Fox (Trans. Amer. Med. Assoc., May, 1927), **discission** is not the satisfactory operation that it is considered to be, and other operations must be devised to replace it. His experience

with **optical iridectomy**, especially in bilateral cases, leads him to urge more frequent consideration of it as the operation of election, even in those cases in which extraction is subsequently required.

**CECUM.—OBSTRUCTION.**—A case of obstruction of the cecum by bands has been recorded by H. M. Rigby (Brit. Jour. of Surg., July, 1925). Acute abdominal pain had suddenly developed, with ileocecal tenderness and tenderness also to the left of the midline. At operation for supposed appendicitis, there was found surrounding the cecum a maroon-colored band adhering to its outer side, where there was a knot, from which the band ran down over the brim of the pelvis. On lifting up the cecum, the band was seen to pass across the appendix near its base, causing an acute kink of it. In the pelvis the band was found attached to a pedunculated fibroid on the right side of the uterus. The band was ligated at the pelvic brim and divided, the knot untwisted, and the band traced up to the free margin of the omentum, where it was also divided. The band is thought to have formed at or after a pregnancy which had occurred 2 years before.

**TUBERCULOSIS.**—Sixty-three cases of tuberculoma of the cecum reported since 1907 are discussed by F. C. Herrick (Ann. of Surg., Apr., 1926). The condition, occurring in tuberculous patients, has been called "hyperplastic tuberculosis" of the cecum, but recent authors favor the term "tuberculoma" as more descriptive. By causing chronic incomplete ileus the condition may constitute a major handicap in recovery from pul-

monary tuberculosis. Incomplete or complete ileus may afford the 1st definite symptoms. The chief mistakes, both in pre-operative and in operative diagnosis, lie in calling the condition appendicitis in young adults or cancer later in life. In several classic cases and some reported more recently, histologic differentiation was difficult or impossible. In young adults simple **exploratory operation** or an **exclusion anastomosis** has been followed by excellent results. In good surgical risks **resection** is preferable. In old patients, where differentiation from cancer can be made, an exclusion anastomosis is best.

**Resection** of the cecum was performed by J. W. Larimore and A. O. Fisher (*ibid.*) in 5 cases of cecal tuberculosis with lung involvement. There was 1 operative death, while in the remainder convalescence was generally uneventful and satisfactory.

**TUMORS.**—Of 48 cases of tumor of the cecum analyzed by Erdmann and Clark (Ann. of Surg., May, 1927), carcinoma constituted 37; tuberculosis, 7; chronic inflammation, 2, and lymphosarcoma, 1. Regional glandular metastasis was found in 25 per cent. Involvement of the ileocecal valve existed in 48 per cent. Other tumors occasionally found in the cecum are cyst, gumma, lipoma, papilloma, cholesteatoma, leiomyoma and actinomycosis. Among 28 cases of carcinoma dealt with surgically there was a mortality of 21.4 per cent.

**UNDESCENDED.**—Three cases of undescended cecum were detected by X-ray examination by A. B. McLean (Glasgow Med. Jour., June, 1926). The patients comprised 2 women of 22 and 27 years and 1 man of 52 years. When the cecum becomes fixed be-

low the liver, as in these cases, the ascending colon, in developing, assumes a V-shape and exhibits 2 parts, descending and ascending, the latter portion being continuous with the transverse colon. The symptoms of this condition are indefinite. In the writer's 3 cases there was constipation. The manifestations may be confused with chronic appendicitis or possibly with cecum mobile. Cases of high appendix, where the surgeon has to search for the appendix just below the liver, are probably often instances of undescended cecum.

**CELIAC DISEASE.**—According to R. Miller (Arch. of Dis. in Childh., June, 1927), wasting of the buttocks is an important early sign of this disorder. It is apt to persist a long time, even where otherwise satisfactory improvement is occurring under treatment. The gluteal wasting, while varying to some extent according to the patient's general nutrition, is disproportionately greater than that in the rest of the body.

**TREATMENT.**—L. W. Sauer (Amer. Jour. Dis. of Childr., Dec., 1927) states that the prognosis in celiac disease depends on the diet rather than on the severity or duration of the disease. An important etiologic rôle is played by noxious intestinal products, probably formed by bacterial action on carbohydrates and fats. The syndrome disappears when these foods, including fresh cow's milk, are omitted, while their premature resumption causes an exacerbation. Circumstantial evidence indicates that the disease might be transmitted from 1 child to another. In a majority of the 25 cases for which it had been prescribed during the preceding

7 years a standard 3-phased **high protein diet** yielded rapid and permanent results. In the 1st phase the child receives only **powdered protein milk** made into a paste with **Ringer's solution**, with the addition of **saccharin**. In the 2d, the Ringer's solution is omitted, and gradually **curd**, without whey, **lean beef juice**, **cottage cheese**, **scraped beef** and **egg** are added. In the 3d phase, **carbohydrates** are added in the form of well-cooked cereals, corn syrup and zwieback, together with well-cooked **vegetables** and **meats**. Bread, potato, sugar, ice cream, candy, cake and fresh milk should never be added within the 1st year, and preferably not until the end of the 2d year, of treatment. If parenteral infections, hot weather, overfeeding, or premature additions to the diet bring on an exacerbation, the 1st phase diet should be at once resumed.

**CEREBELLUM.**—From experiments, Clarke (Brain, Dec., 1926) concluded that the cortex of the cerebellum is inexcitable, in the sense of originating impulses that act directly on particular groups of muscles. The only part of the cerebellum sensitive to electric stimulation is the region of the central nuclei and the floor of the 4th ventricle, but the reactions obtained from here are due to spread of the electric current to neighboring bulbar and mesencephalic structures, or to its conduction by the paths of least resistance to parts of the nervous system with which the cerebellum is closely connected. The most frequent responses to cerebellar stimulation in all the animals employed were movements of the head and eyes, but these movements did not resem-

ble those due to direct response of a motor center to a stimulus, being slower and more deliberate, and are to be regarded as secondary effects of impulses conveyed to the brain-stem.

**TUMORS.**—The 275 cases of *cysts* of the cerebellum analyzed by A. Lindau (Acta path. et microbiol. Scand., Suppl. 1, May, 1926) are stated by him to have made up nearly 10 per cent. of all the recorded instances of cerebellar tumors. Most of the cysts formed part of a tumor, such cystic tumors being of 2 sorts, *viz.*, (1) angioplastic tumors, small, circumscribed, cortical or subcortical, generally located laterally or posteriorly, and exhibiting the structure of hyperplastic capillary angiomas, sometimes with small giant cells; (2) gliomas, very variable in size, generally located dorsally or medially, especially in the superior vermis, and with the cyst wall consisting of glia and generally devoid of ependymal lining. The writer witnessed a case of *angiomatosis of the retina* (*von Hippel's disease*) associated with cyst and capillary angioma of the cerebellum. Retinal angiomatosis is, indeed, in 20 per cent. of all cases associated with intracranial tumors, which, in the cases studied pathologically, have been cerebellar cysts or angioplastic tumors of the cerebellum and bulb. Eight published cases have been complicated by pancreatic cysts, 10 by kidney cysts, and 6 by hypernephroma.

In a case reported by Schloffer (Med. Klin., Oct. 9, 1925), nearly the whole right  $\frac{1}{2}$  of the cerebellum was resected, only the dentate nucleus and a few other portions remaining. Complete recovery followed, and the man of 40 years had almost no symptoms from loss of the cerebellar hemisphere.



In a patient with *cystic neuroglioma of the cerebellum*, C. Perret (Rev. méd. de la Suisse rom., Mar. 25, 1926) performed repeated **punctures** with gratifying results. The patient had had a fall on the back of the head at 7 years, which had caused 2 epileptoid attacks in childhood and severe headache at puberty, and is thought to have eventually been the source of the tumor formation. At 32 years the patient was seen when blind and comatose. The diagnosis being cystic tumor, probably in the right cranial fossa, puncture was performed and 20 c.c. of clear fluid obtained. All the symptoms disappeared for 6 weeks, after which the condition suddenly got worse. Puncture was repeated and followed by **trephining** and **drainage**, with the result that the patient was enabled to resume his regular occupation for 3 years. Another recurrence, with trephining, restored health for 2 years, at the end of which time a further recurrence proved refractory to treatment, death in coma taking place.

Magnus (Norsk Mag. f. Laeg., Feb., 1928) reports a successful case of **operation** for cerebellar tumor. At 14 years the cerebellum had been exposed for symptoms of tumor, and the left cerebellar lobe found slightly prominent, yielding 3 or 4 c.c. of yellow fluid on *puncture*. For the succeeding 2½ years there were no signs of tumor. Then left abducens paralysis and slight facial and trigeminal paralysis were observed, with constriction of the visual field on the nasal side, especially in the right eye. At operation the whole left cerebellar lobe was found the seat of destruction by cystic degeneration of an egg-sized glioma, which was readily removed. Some 4 years

later the patient was still well, aside from the paralysis of the 5th and 7th cranial nerves.

### CEREBRAL HEMORRHAGE.

—In a study of the relative frequency of cerebral hemorrhage and softening, C. Foix, P. Hillemand and J. Ley (Bull. Soc. méd. des hôp. de Paris, Feb. 17, 1927) found that, omitting small foci of lacunar softening and scars of miliary hemorrhages, and counting only cases with severe symptoms, there were 100 cases of softening to 24 of hemorrhage. Even in cases of fatal "strokes" softening predominates. Of 66 patients who died within 3 weeks of the attack, softening existed in 47 and hemorrhage in only 19.

**PATHOGENESIS AND PATHOLOGY.**—According to anatomic and clinical data assembled by J. H. Globus and J. Strauss (Arch. of Neurol. and Psych., Aug., 1927), spontaneous massive cerebral hemorrhage is a terminal phase in a sequence of events beginning in a generalized or somewhat localized disease of the cerebral vessels and which results in the closure of 1 or more of such vessels in a given, circumscribed area. This results in an ischemic zone and a consequent focal encephalomalacia. An area of diminished resistance is thus created which is an important if not a determining factor in the causation of cerebral apoplexy. In the presence of a diseased blood-vessel and increased vascular tension, a reduction in the consistency of the surrounding brain tissue is an essential precursor to the rupture of the vessel wall and the unhindered escape of blood. The anatomic manifestations supporting this view are: (1) The presence of

generalized vessel disease; (2) the diffuse productive changes throughout such brains; (3) the well-defined organization in the wall limiting a hemorrhagic cavity; (4) the presence of exposed blood-vessels in the cavity; (5) the infrequent occurrence of miliary aneurisms in the cases studied.

In pathologic studies on 16 cases of apoplexy, mostly due to hemorrhage, K. Westphal and R. Bär (Deut. Arch. f. klin. Med., Apr., 1926) found that all the vessels, including the arteries, capillaries and veins, in the hemorrhagic focus showed lesions, sometimes amounting to complete necrosis. The simple bursting of a vessel does not account for the changes. The hemorrhage occurs from all the vessels, but the attack starts with a sudden angiospastic or arteriosclerotic local anemia; the hemorrhage then results at the time of restoration of the blood-flow in the artery. Somewhat similar are the views of K. Neubürger (Zent. f. d. ges. Neurol. u. Psych., Nov., 1927), who made a histologic study of the cornu Ammonis in 17 cases of cerebral hemorrhage, mostly recent. Nearly always an anemic condition of the tissues was found, with retrogressive changes in the ganglion cells. There is evidently a preëxisting ischemia due to vasomotor disturbances. Vascular innervation seems to play an important rôle in the pathogenesis of apoplexy.

**DIAGNOSIS.**—To determine whether or not an apoplectic attack is due to hemorrhage, J. Wilder (Wien. klin. Woch., Sept. 8, 1927) finds *van den Bergh's serum bilirubin test* of value. Hemorrhage is indicated by a bilirubin content exceeding 1:200,000. The test affords early differentiation between hemorrhage and softening, as

the serum bilirubin increases within 24 hours after the seizure. It is also very persistent, being demonstrable as late as 4 weeks after the attack.

According to E. R. Le Count and C. C. Guy (Jour. Amer. Med. Assoc., Dec. 2, 1925), cases of cerebral hemorrhage are frequently mistaken for *uremia*. Out of 30 cases with verified cerebral hemorrhage, in 9 the clinical diagnosis had been uremia, uremic coma or chronic nephritis. Sixteen had been correctly diagnosed as cerebral hemorrhage, while in 2 there had been mistaken diagnoses of skull fracture, and in 1 each, of poisoning, meningitis, and diabetic coma. No patient clinically diagnosed as uremia but actually dying of cerebral hemorrhage had a nitrogen retention comparable to that of true uremia. In spontaneous intracerebral hemorrhage the increase above normal of the various nitrogenous elements of the blood ranged from 16 to 43 per cent., the creatinin being the least increased and the uric acid the most. Presence of blood in the spinal fluid and the great increase in the nitrogenous elements of the blood are apparently the 2 most important factors in differentiating uremia and spontaneous intracerebral hemorrhage.

**CEREBRAL HEMORRHAGE IN INFANCY AND CHILDHOOD.**—In a series of cases W. P. H. Sheldon (Quart. Jour. of Med., July, 1927) found convulsions a fairly common symptom, being mentioned in 59 per cent. Where the convulsions were the 1st indication of cerebral hemorrhage, it was noticeable that the symptom was not an initial or early occurrence in the disease, but appeared when the illness was already advanced. The convulsions

were seldom of localizing value, but the paralysis which sometimes followed corresponded more closely to the area of hemorrhage. A combination of irritative and paralytic symptoms may be the indication of hemorrhage; such signs are generally, but not always, rapid in onset. In some of the cases in which life continued for a few days after the initial symptoms of hemorrhage, retinal examination showed swelling of the discs; the signs of meningeal irritation, such as retraction of the head and Kernig's sign, were also noted in several instances. Postmortem evidence showed that although in some cases, notably those with malignant endocarditis, the situation and extent of the hemorrhage was sufficient *per se* to have caused death, in others the patient died because of the severity of the primary disease, and but for that, could have recovered from the lesion produced by hemorrhage.

Out of 13 cases of meningeal hemorrhage in the newborn followed by L. Velasco Blanco and H. Paperini (Jour. Amer. Med. Assoc., Oct. 16, 1926) which survived longer than 24 hours, permanent recovery without sequelæ occurred in 6. Even in the most desperate cases a cure is possible in a greater percentage than has hitherto been believed, provided an early diagnosis is made, followed by energetic treatment. In the diagnosis, in addition to the obstetric history, consideration must be given to such symptoms as asphyxia with dysphagia, bulging fontanel, convulsions, continuous moaning, stupor or coma, and opisthotonos. But as these symptoms are not pathognomonic, lumbar puncture is necessary for diagnosis. In the majority of cases the treat-

ment is exclusively medical and consists of decompression by **spinal puncture** and the hemostatic action of **normal horse serum intraspinally** and **gelatin subcutaneously**.

#### CEREBROSPINAL FLUID.—

Evidence is accumulating, according to H. S. Forbes, F. Fremont-Smith and H. G. Wolff (Arch. of Neurol. and Psych., Jan., 1928), that the choroid plexus may be regarded as a semipermeable membrane and the cerebrospinal fluid as a true dialysate rather than a secretory product. In each of 12 animals experimented upon by the writers, Prussian blue granules could be found within the vessels of the choroid plexus. This indicated that the direction of the flow of cerebrospinal fluid through this plexus can be reversed by increasing the osmotic pressure of the blood, thus favoring the view of the fluid being a dialysate and not a secretion.

**TENSION.**—That differences in the pressure of the spinal fluid on lumbar puncture arise according to the *position of the patient's head* is pointed out by Klessens (Ned. Tijd. v. Gen., May 15, 1926). In 70 tests there were differences of 2 to 16 cm. of water according as the head was held erect or bent forward on the chest. Absence of such a difference in any given case suggests obstruction in the communication between the intracranial and spinal cavities.

A. Tzanck and P. Renault (C. r. Soc. de biol., Jan. 28, 1927) observed in 12 normal subjects that the cerebrospinal fluid and *venous pressures* were identical, while in disorders attended with high venous pressure the cerebrospinal fluid pressure was nearly always high. In spinal fluid hypertension the venous pressure should be determined at the same time, as a discrepancy between the 2 pressures may be of diagnostic significance. The normal correspondence between the 2 pressures is accounted for by the close connection of the subarachnoid space with the surrounding venous plexuses and thus with the *venæ cavæ*.

That the *retinal arterial pressure*, as determined with Bailliart's ophthalmodynamometer under control of the ophthalmoscope, is of diagnostic service in reflecting

the cerebrospinal fluid pressure is maintained by H. Claude, A. Lamache and J. Dubar (Prog. méd., Sept. 3, 1927). If local lesions are absent, lack of correspondence between the retinal and general systolic pressures indicates a disturbance of the intracranial pressure. Normally the retinal systolic pressure is 65 to 70 mm. Hg and the retinal diastolic pressure 35 mm. The retinal diastolic pressure is approximately  $\frac{1}{2}$  of the radial diastolic pressure. As a rule, it is constant, but it may vary as a result of emotion. The same observers (Paris méd., Oct. 15, 1927) term "*relative hypertension*" of the cerebrospinal fluid a rise of the pressure above its constant level for the individual, taken at rest and in recumbency. Such a rise may take place under the influence of some mechanical, physiologic or infectious factor. The term "relative" implies that the pressure, while above its basal level, does not exceed normal limits. Of 16 instances of such relative hypertension, 5 were due to infectious diseases; 3 to intoxication by alcohol, coffee and theobromine, respectively; 2 to trauma, and 5 to cardiac decompensation or to menstruation. Incipient serous meningitis is held to be the immediate source of the hypertension. Treatment is by **hypertonic solutions** or **lumbar puncture**.

*Theobromine* in daily doses of 1 to 1.5 Gm. (15 to 23 grains) tends to raise the cerebrospinal fluid pressure by increasing the secretion of this fluid, according to R. Targowla and A. Lamache (Paris méd., Jan. 8, 1927). In 1 illustrative case 1 Gm. administered on 8 successive days raised the pressure by 12 cm. of water. The increase in cerebrospinal fluid pressure was always paralleled by increase of urinary output, and there is evidently a connection between the secretions of the renal and choroid plexus epithelia. Both of these secretions are influenced by the sympathetic system, upon which theobromine acts. Unpleasant by-effects of lumbar puncture may be obviated by the use of theobromine.

In determinations of the cerebrospinal fluid pressure in 54 subjects following intravenous, oral or rectal administrations of *hypertonic solutions* or *distilled water*, H. Claude, A. Lamache, J. Cuel and J. Dubar (Presse méd., Mar. 10, 1928) found that to

obtain marked and lasting changes in pressure, massive and repeated doses must be given. Distilled water intravenously is to be recommended in all cases of acute hypotension of the cerebrospinal fluid following cranial trauma or lumbar puncture. The hypertonic solutions may be tried in some persistent headaches and in hypertensive manifestations following lumbar puncture; in these cases oral use of the solutions is recommended. In hypertension due to brain tumor, a hypertonic injection is of especial value at operation to cause a transient lessening of tension in the dura. In serous meningitis reduction of pressure by lumbar puncture seems preferable. In post-traumatic hypertension, lumbar puncture remains the treatment of choice.

**PROTEINS.**—As noted by B. Corkill (Med. Jour. of Austral., June 12, 1926), the cerebrospinal fluid normally contains a small amount of albumin (0.013 to 0.03 per cent.), consisting of both serum globulin and serum albumin. In all meningeal inflammations, the albuminous bodies are increased, chiefly the serum albumin. Thus, with an increase in the total albumin, the ratio of globulin to albumin is about 1:8. In subacute and chronic syphilitic diseases the globulin increase becomes more pronounced, the ratio becoming 1:2 or 1:3. In the more acute forms of meningitis, whether tuberculous, meningococcal or syphilitic, the albumin content rises to 0.2 or even 0.3 per cent. High values are especially frequent in meningococcal meningitis. In these cases the ratio of globulin to albumin may be 1:12. To determine the total albumin content it is necessary to have a series of standard dilutions of albumin ranging from 0.1 to 0.01 per cent. The easiest plan is to make a series of dilutions from normal human blood serum on which a Kjeldahl determination has been made to ascertain the protein content. In preparing the standards 2 c.c. of the diluted serum are placed in a test-tube, 0.3 c.c. of 30 per cent. dilution of trichloroacetic acid added, and the mixture boiled, completely precipitating the albumin. The tube is then sealed off and the percentage of albumin labelled on it.

In testing cerebrospinal fluid, 2 c.c. of it are placed in a like test-tube, 0.3 c.c. of the trichloroacetic acid dilution added, the



mixture boiled, and the precipitate compared with the standards.

In 14 normal and pathologic cerebrospinal fluids Hewitt (Brit. Jour. of Exp. Path., Feb., 1927) found the average globulin-albumin ratio 1:6; in 3 tabetic fluids, 1:3, and in 16 general paralytic fluids, 1:13. Normal fluid contains about 0.02 per cent. of albumin and about 0.003 per cent. of globulin, of which by far the greater parts is pseudoglobulin. The writer describes a colorimetric method for the determination of the total protein and the various protein fractions.

**SUGAR.**—According to W. P. Stowe (Jour. of Lab. and Clin. Med., Jan., 1926), the general trend of recent literature is to raise the figure ascribed to the sugar content considerably above that given by the earlier French workers and by Foster, and place it in the neighborhood of 75 mgm. per 100 c.c. When series of cases of neurosyphilis, lethargic encephalitis and other conditions other than meningitis are examined, their deviation from the normal range and median point is found to be so slight as to be without diagnostic significance. *Tuberculous meningitis* gives values so definitely above the purulent meningitis cases and below all other conditions that an almost certain diagnosis can be quickly made in this disease. The occasional purulent fluids obtained after intraspinal therapy, in brain tumor cases with necrosis or hemorrhage near the ventricles, in sympathetic aseptic meningitis, etc., can be rapidly delimited by their normal sugar content from infective meningitis in which the causative organism may not be promptly found. The presence of pus cells alone in the cerebrospinal fluid does not reduce its sugar content.

K. Blum (Deut. Zeit. f. Nervenhe., July, 1926), from a study of 105 normal subjects, concluded that in the sugar determinations it is necessary to determine also the blood sugar. The cerebrospinal fluid and blood sugars have a certain ratio, the former being about 53 per cent. of the latter. Similarly, B. L. Crawford and A. Cantarow (Amer. Jour. Med. Sci., June, 1926), in tests in 210 cases, found normal variations of spinal-fluid sugar along with variations in blood sugar, with an approximate ratio of 1:2, from moderate hypoglycemic

to moderate hyperglycemic levels. Accordingly, the time of day and relation to meals must be considered in studying spinal fluid, unless the blood sugar is determined simultaneously. Great increase in globulin and high sugar content are characteristic of increased intracranial pressure in general, and particularly of brain tumor. High sugar values were also obtained in various functional mental disorders.

To have any diagnostic significance, the cerebrospinal fluid sugar content must, according to Grayzel and Orent (Amer. Jour. Dis. of Childr., Dec., 1927) be determined on fluid obtained from the fasting subject, preferably after a fast of 10 hours or more.

**CHLORINE.**—Corkill (*loc. cit.*), in estimating the chlorides in the cerebrospinal fluid, uses a standard silver nitrate solution of 5.814 Gm. per liter, with a saturated solution of potassium chromate as indicator. One c.c. of the silver nitrate solution is equivalent to 1 part of chloride per 1000. The normal chloride content is about 0.07 per cent. While some have asserted that high chlorides indicate renal inadequacy, the writer's experience has not borne this out. Low chloride values are deemed pathognomonic of *tuberculous meningitis* but do not always exist in this condition.

**COLLOIDAL REACTIONS AND OTHER TESTS.**—**Neurosyphilis.**—A new and comparatively simple colloid test serviceable in the diagnosis of neurosyphilis, the *Takata-Ara colloidal test*, is endorsed by E. Blum (Zeit. f. d. ges. Neur. u. Psych., cx, 504, 1927). The first step in the test is the addition of 1 drop of 10 per cent. sodium carbonate solution to 1 c.c. of spinal fluid. After shaking, there is further added 0.3 c.c. of equal parts of 0.5 per cent. mercury bichloride solution and 0.02 per cent. fuchsin solution. With normal cerebrospinal fluid this mixture remains a clear violet. In parasyphilitic diseases it becomes cloudy and a precipitate forms. Three grades of response are recognized, according to the promptness and extent of precipitation and the clearness of the supernatant fluid. In meningitis the fluid turns red. For reliable results the specimen must be quite free of blood. Among 200 syphilitic cases, mostly of paresis and tabes, 98 per cent. were positive with this test.

The negative cases had for the most part been treated by malarial inoculation.

The *colloidal gold* and *colloidal mastic* tests were compared by R. C. Henderson (U. S. Vet. Bur. Med. Bull., Aug., 1927) in 49 cases. The gold curve is more reliable than the mastic as an indication of general paralysis, because of the greater frequency with which the latter occurs in other types of neurosyphilis. The mastic "3" curve seems to indicate borderline cases, and should be interpreted in connection with other evidence, laboratory and clinical. While there is a close parallelism between the gold and mastic tests, one should not be substituted for the other when performance of both is feasible.

The *colloidal benzoin* test in the cerebrospinal fluid was compared with the *Wassermann* test in 536 cases by Urechia and Ciocan (C. r. Soc. de biol., May 28, 1926). Among 38 cases of general paralysis the benzoin test was positive in all and the Wassermann in 32. In the blood serum of these cases, the benzoin test was positive in 34 and the Wassermann in 26. In 233 cases of primary or secondary syphilis the benzoin test was positive in 209, the Wassermann in 139. In 139 cases of visceral syphilis the benzoin test was positive in 123, the Wassermann in 95. In 7 cancer cases the benzoin test was uniformly negative, the Wassermann faintly positive in 3.

The *Boltz* or *acetic anhydride-sulphuric acid* test of the cerebrospinal fluid was found by Novick and Hines (U. S. Vet. Bur. Med. Bull., Feb., 1928) in 37 cases of *general paralysis* to be in striking parallel to the globulin content. In 32 cases free of syphilis and with spinal fluids negative in all respects the Boltz test was found similarly negative. Increase of globulin was uniformly attended with a positive Boltz test. In 7 cases free of syphilis but showing traces of globulin, the test gave parallel results. L. D. Cady (Arch. of Neur. and Psych., Oct., 1927) found a modified Boltz test, employed on a total of 799 specimens of spinal fluid, positive in 79 to 94.6 per cent. of cases of *neurosyphilis*, where the test had not been rendered negative by treatment. It was positive in 42.4 per cent. of 264 non-syphilitic neuropsychiatric patients. It was positive in 27.2 per cent. of 77 patients

with constitutional diseases, chiefly in cases of arthritis of the spine. He concludes that the original test seems of some value in indicating abnormal processes in the meninges and central nervous system, and promises to be of a value at least equal to other routine non-specific chemical tests. The modified test may have considerable value in controlling the treatment of neurosyphilis.

**Tuberculous Meningitis.**—Aiello (Rif. med., Jan. 10, 1927) recommends the following *tryptophan* test in the diagnosis of this disorder. From 2 to 3 c.c. of clear spinal fluid are mixed with 15 to 18 c.c. of concentrated fuming HCl—specific gravity at least 1020—and 1 or 2 drops of 2 per cent. formaldehyde solution. Four or 5 minutes later, 25 to 30 drops of 0.06 per cent. sodium nitrite solution are slowly run in along the side of the tube. If tryptophan is present, a violet ring appears at the area of contact within a few minutes. In a negative response, a yellow cloud is formed. Out of 1000 cases in the literature in which this test was performed, the response was positive in over 90 per cent. of the cases of tuberculous meningitis. There were only 2 per cent. of false positive results, and a negative result almost excludes the disease.

**THERAPEUTICS.**—The *iodine* content of the cerebrospinal fluid can be persistently increased by giving potassium iodide by the mouth, according to D. Campbell and W. R. Snodgrass (Jour. of Pharm. and Exp. Ther., June, 1926), and a further great increase can be secured by giving sodium iodide intravenously. It is suggested that at some period in the treatment of **syphilis of the central nervous system** a series of intravenous iodide injections may be usefully employed. The more powerful intermittent action of the intravenous iodide must, however, be maintained throughout by oral iodide administration. Arsphenamin substitutes can be dissolved in the sodium iodide solution, so that only 1 intravenous injection is necessary when iodide is to be combined with organic arsenic medication.

**CERVICAL RIB.**—Among 303 cases of cervical rib analyzed by A.

W. Adson (Atlantic Med. Jour., Jan., 1928), the condition was revealed by X-ray to be bilateral in 143. In 167 the disorder was discovered accidentally, symptoms being absent. In 100, symptoms were mild and of such a character that surgical treatment was deemed inadvisable. In 77 of these there was indefinite pain in the neck and shoulder, radiating only slightly down the arm and hand; in 5, the pain was localized and radiated along the ulnar nerve; in 2, along the internal cutaneous nerve, and in 4, over the brachial plexus. In 12, pain was increased by rotation of the head or elevation of the chin. There was slight atrophy over the ulnar distribution in 12. Subjective anesthesia was present in 13 cases; circulatory disturbance, in 4. **Surgical treatment** was carried out in 41 cases. The anterior approach and **tenotomy of the scalenus anticus** are preferred by the writer to the transcervical approach and resection of the cervical rib, since the same relief is offered, the procedure is less formidable, and post-operative numbness in the arm and palsy of the brachial plexus are avoided.

**CESAREAN SECTION.**—The *bacterial content of the uterus* as observed in 50 Cesarean sections has been recorded by J. W. Harris and J. H. Brown (Amer. Jour. of Obst. and Gyn., Feb., 1927). In 19 elective sections performed at an appointed time at the end of pregnancy, and before the rupture of the membranes, the uterus was uniformly sterile. This applied also to 6 cases in which the classic section was performed within 4 hours after the onset of labor. In 5 patients with classic section 6 or

more hours after the onset of labor, bacteria could always be demonstrated in the lower uterine segment, and there were streptococci in 3 cases. Similar results were obtained in 13 low cervical and 6 radical sections, and the uterine contents were sterile only in the 3 cases in which the operation was performed within a few hours after the onset of labor. These findings show plainly why the conservative section is safe only when performed at the time of election. Absence of vaginal examinations and of premature rupture of the membranes does not insure a sterile uterus. A normal temperature is no proof that ascending infection has not already occurred.

Because the danger of infection after the operation increases with the duration of labor, as well as the good results obtained with Cesarean section during pregnancy in eclampsia and placenta previa, W. Zangemeister (Mon. f. Geb. u. Gyn., Sept., 1927) has for years been carrying out Cesarean sections early, *viz.*, at the beginning of labor or even before its onset. He has found the danger of infection greatly lessened thereby. The fear of lochial retention and hemorrhage from the placental site is unfounded. To provide for the escape of lochia, etc., where the cervix is still closed—such free lochial escape being a preventive of infection—he uses for dilating the cervical canal a special dilator shaped like a posthorn, inserted from above.

In a review of all abdominal Cesarean sections performed in Detroit in 1925, W. E. Welz (Amer. Jour. of Obst. and Gyn., Mar., 1927) found 154 sections performed in 10,425 deliveries in 19 hospitals. Of these operations, 57 per cent. were done by obstetricians and 43 per cent. by surgeons. There were 20 maternal deaths (13 per cent.)

and 17 infantile deaths (11 per cent.), the latter including stillbirths and neonatal deaths. Among 61 sections performed because of contracted pelves or previous sections in contracted pelves there were 3 maternal deaths (5 per cent.) and 2 infantile deaths (3.4 per cent.). Among 26 abdominal sections for toxemias of late pregnancy and eclampsia, there were 11 maternal deaths (42.7 per cent.) and 5 infantile deaths (19 per cent.). The writer concludes that the rate of Cesarean sections was too high and the death rate from sections performed likewise too high. In no conditions is section so contraindicated as in eclampsia and the toxemias of late pregnancy.

On the other hand, R. K. Smith and T. H. Kelly (Cal. and West. Med., June, 1927) report 159 sections performed from 1909 to 1925 because of obstructed pelves, with but 1 maternal death (0.59 per cent.) and 3 infantile deaths (1.8 per cent.). In the last 30 operations the low incision was used. Adding to these a series of sections done because of previous sections, there was a total of 248 cases with 1 maternal death (0.4 per cent.) and 4 infantile deaths (1.6 per cent.).

**OPERATIVE METHODS.**—J. O. Polak (Surg., Gyn. and Obst., Apr., 1926) stresses the following features in *transperitoneal* Cesarean section: (1) The low abdominal incision; (2) placing the traction suture in the uterus at the upper limit of the abdominal incision, which, when held taut, makes a perfect occlusion of the wound; (3) separation of the peritoneal flap, including the bladder; (4) delivery of the fetus by the head; (5) allowing the placenta to separate spontaneously; (6) packing of the uterus with washed iodoform gauze to stimulate its con-

traction and retraction, this gauze usually being found in the vagina after 24 hours; (7) complete occlusion of the uterine wound by suture of the bladder reflexion over it, thus preventing leakage and intestinal adhesions.

To obviate contamination of the peritoneum and uterine incision by spill of fluid when the bag of waters is ruptured within the uterus, G. De Courcy (Amer. Jour. of Surg., Jan., 1928) delivers the child within the gestation sac, avoiding rupture until it has been removed entirely from the operative field.

Since it is now proven that the bacterial content of the uterus rises with the duration of labor, B. Solomons (Brit. Med. Jour., Nov. 19, 1927), of the Rotunda Hospital, Dublin, deems the *lower segment operation* that of choice where Cesarean section is indicated for patients in labor. It is indicated for placenta previa in selected cases. The lower segment is preferred to the upper because a scar covered by peritoneum is less likely to lead to general peritoneal infection. The lower segment operation allows a trial of labor. The incision in the uterus should be longitudinal or elliptic, depending on the position of the head. The placenta should always be delivered through the uterine incision. Uterine suture by 2 layers of continuous catgut sterilized by the alcohol-iodine method has been attended with immediate post-operative success; the remote results have yet to be ascertained. Drainage of the abdomen for 48 hours is advisable in all suspicious cases.

As a procedure useful in patients in whom a classic section would be fraught with the greatest dangers,



G. L. Brodhead, E. G. Langrock and C. S. B. Cassasa (N. Y. State Jour. of Med., Mar. 15, 1927) describe an operation in which there is prepared a quadrilateral area on the anterior surface of the uterus, excluded from the general peritoneal cavity, through which the infant may be extracted. Stitches of plain gut are 1st placed horizontally at the upper and lower angles of the incision, uniting the peritoneum of the anterior abdominal wall to the anterior surface of the uterus at these points. These 2 stitches form the upper and lower limits of the quadrilateral space, the vertical limbs of which, 6 inches long, are prepared by using the long ends of the sutures to sew to the opposite angle of the wound. These are continuous overlapping sutures, each placed  $\frac{3}{8}$  inch from the cut edge of the peritoneum, and uniting the peritoneum to the anterior uterine surface. The quadrilateral area is thus  $\frac{3}{4}$  inch wide, and through it the uterus is opened and the child extracted by the breech. The uterus is closed in 2 layers, then the flaps of parietal peritoneum and the remainder of the abdominal wound. The patient is thus left with a high fixation of the uterus, but the writers had no patient that was later inconvenienced by this fixation at menstruation or in later pregnancies.

A successful case of *Portes's operation*, i.e., Cesarean section followed by *temporary exteriorization of the uterus*, is reported by L. E. Phaneuf (Surg., Gyn. and Obst., June, 1927), who enumerates the following as the chief indications for this operation: (1) When frank infection exists, with the child living and the condition of the pelvis such that abdominal delivery is indicated. (2) In infection with

a dead child, and delivery by the natural passage fraught with danger.

(3) When any maneuver through the birth canal might result in rupture of the uterus, even with a dead child, e.g., especially in the neglected labor case with marked uterine retraction.

(4) In the presence of a pelvic indication for abdominal delivery with fetal putrefaction and grave maternal infection. In this operation the uterus is 1st delivered through a long abdominal incision, the abdominal wall closed behind it to the cervix, a high uterine incision made, the child, placenta and membranes extracted, and the uterus closed and allowed to remain on the abdomen. The 2d stage of the operation involves 1 of 2 procedures: If the patient does well, involution is permitted to take place, and when the uterus is clean and the incision in it well healed, the abdominal incision is reopened and the uterus and adnexa replaced. Drainage is placed behind the uterus and the abdominal wall closed. On the other hand, if the sepsis seems uncontrollable, a hysterectomy may be performed extra-abdominally after shock is past. In all reported cases in which the uterus was replaced (after extrusion for 15 to 86 days) recovery occurred.

The same writer (Amer. Jour. of Obst. and Gyn., Mar., 1928) states that *vaginal Cesarean section* is useful when an indication for immediate delivery arises in a gravida with a long, rigid, undilated cervix up to the end of the 8th month of gestation. While operation can be done at term, the difficulties are then greater, and there is danger of the incisions tearing into the peritoneal cavity. A previous low cervical Cesarean section compli-

cates the operation. The vaginal operation being extraperitoneal, post-operative complications are negligible, and the puerperium is similar to that of any operative pelvic delivery.

In 2 successful cases of Cesarean section *after death*, reported by Küstner (Zent. f. Gyn., Feb. 11, 1928), terminal asphyxia of the mother for 25 and 45 minutes, respectively, preceded death. Yet both infants were delivered alive and continued so. It appears that the fetus requires but little oxygen to survive and that none of the oxygen delivered by the placenta to the fetus is allowed to return to the mother, however much her blood may be laden with carbon dioxide.

**CHANCROID.**—Local application of **antimony and potassium tartrate** in dilute solution to chancroidal ulcers is advocated by E. Rupel (Jour. Amer. Med. Assoc., Feb. 20, 1926). This agent, while it removes the necrotic tissue in 24 to 48 hours, is so mild that it does not continue to erode beyond the base, and therefore may be used repeatedly for its germicidal effect and its ability to remove any new pathologic tissue which forms. Repeated applications of the ordinary caustics result in a deepening and widening of the ulcer, and make it impossible to utilize the germicidal properties that caustics possess.

P. G. White and J. Q. Owsley (U. S. Naval Med. Bull., July, 1927) treated 25 cases of chancroid by successive application of a saturated solution of **silver nitrate** crystals in 28 per cent. ammonia, a 25 per cent. solution of **liquor formaldehydi**, and pure **eugenol**. With this treatment healing occurred in an average of 10 to 15 days, as against 1 to 3 months under other treatments.

**Nascent iodine** treatment is advocated by Cergueira Pereira (Rev. med.-cir. do Brazil, Feb., 1926) in both chancroid and in *tropical and sluggish ulcers*. The lesion is 1st cleansed, anesthetized with 1 per cent. **stovaine** solution, dried, a thin covering of **iodoform** placed on it, and fumes of iodine generated from the latter by drawing a hot glass rod lightly over the area. A black coating of the lesion results. In 6 cases, complete recovery occurred under 6 or 7, or at most, 11 applications.

In addition to local treatment, A. E. Jones (Jour. Amer. Med. Assoc., May 28, 1927) advocates the giving of **antimony and potassium tartrate intravenously**. A 1 per cent. solution of it is injected in a dose of 3 c.c. (48 minims), increased 1 c.c. (16 minims) with each dose until 10 c.c. (160 minims) is reached. The injections are made at 4-day intervals. Of 27 cases thus treated 23 showed excellent results. Pain, discomfort, discharge, edema, etc., lessen or nearly disappear after the 1st few injections. Convalescence is reduced by at least one-half.

There were no serious reactions from the injections, although 30 per cent. of the cases had mild reactions manifested in cough, salivation or vomiting, always clearing up in a few hours.

Experience with treatment by **Ducrey's streptobacillus vaccine** in 15 cases is recorded by Lortat-Jacob and Poumeau-Delille (Paris méd., June 26, 1926). About 225 million bacilli were usually administered at the 1st intravenous injection, and subsequently 335, 450 and 550 millions. From 3 to 5 injections were given, at intervals of 3 to 5 days. There

was always a marked general reaction. The treatment seemed less effective as regards the chancroid itself than the complications, since only 5 chancroids were healed by it out of 15 cases, whereas nearly all the buboes were cured in 2 or 3 days. The vaccine may, however, be advantageously combined with local treatment of the chancroid.

H. Jausion and A. Pecker (Bull. Soc. franç. de dermat. et syph., July, 1927) observed cure of 6 cases, usually within 20 days, following 3 or 4 intravenous injections of a vaccine prepared from *Bacillus subtilis* in the full stage of sporulation. Febrile reactions of 104° F. (40° C.) were produced, the treatment constituting a form of pyretotherapy. One case of buboes was also cured.

**BUBOES.**—Cultures on sheep blood, with or without agar, were made by Durand (C. r. Soc. de biol., June 11, 1926) from chancroid buboes in 22 cases. In all instances Ducrey's streptobacillus was found. Among 4 suppurating buboes it was accompanied by the staphylococcus in 3 and the streptococcus in 1. Among 19 buboes without suppuration it was accompanied by the staphylococcus only in 1 instance.

Clusellas (Semana méd., Apr. 21, 1927) had favorable results with **auto-hemotherapy** in 70 per cent. of 23 cases of chancroid buboes. The blood was injected in the buttocks on alternate days in doses ascending from 5 to 10 c.c. The number of injections ranged from 2 to 9.

The treatment always shortened the course of the disease, and where suppuration was already present, obviated rupture of the abscess to the exterior.

**CHENOPODIUM.**—After several years' research, A. Machado (Brazil Méd., May 21, 1927) has produced a new vermifuge, **ascaridol**, in which the unpleasant taste is masked even though the activity of the drug is marked. It is a dextrogyrate, racemic, terpenic peroxide having the characters of the natural ascaridol.

**CHEST.—X-RAY DIAGNOSIS.**—Forestier (Ann. of Clin. Med., May, 1926) found not only that the injection of *lipiodol* into the bronchial tree facilitated roentgenography, but that it seemed to afford relief in **suppurative pulmonary disorders**.

In *increased intra-abdominal pressure*, Guthrie (South. Med. Jour., Feb., 1927) found the following indications in the thoracic areas to be helpful whenever the diaphragm is pushed upward: 1. The left half of the diaphragm is more freely movable than the right, and as intra-abdominal pressure is increased it is carried upward. 2. The apex of the heart moves with the diaphragm, and often a diameter of 1 whole intercostal space is traversed. 3. The Kroenig area is diminished on the left side during moderate general abdominal compression. The right Kroenig area is then practically unchanged. 4. The transverse diameter of the vessels at the base of the heart is increased by increase of abdominal pressure. 5. Normally, the posterior and inferior boundary of lung resonance lies at or near the level of the 10th thoracic spine on the left and at the 9th thoracic spine on the right. When abdominal pressure is increased to a certain point, the left base is found higher than the right. 6. The external boundary of the Kroenig area posteriorly, which rests normally on the tubercle of the spine of the scapula on both sides, moves inward from the tubercle several centimeters, proportionate to the degree of the pressure.

**TUMORS.**—In a series of 16 cases operated by Harrington (Arch. of Surg., Jan., 1927), 11 were instances of malignant tumor, 2 of which were intrathoracic. Early **radical removal** of the malignant neoplasm followed by **radiotherapy** immediately after the operation gave the best results.

Where the growth was extensive, partial removal followed by the use of radium did not seem to prolong life or even relieve the symptoms. In 6 of the cases, there has been no recurrence in from 11 to 18 months. In 1 of the intrathoracic cases, a small recurrent growth was removed 6 months after the initial operation. In 3 cases, death followed recurrence within 6 months after operation, all of these being children suffering from extensive malignant neoplasms.

### CHEYNE-STOKES SYNDROME.

—Adler, Elias and Spitz (Wien. klin. Woch., Jan. 13, 1927) obtained improvement in 8 out of 10 cases of Cheyne-Stokes breathing by injecting intravenously from 80 to 100 c.c. ( $2\frac{2}{3}$  to  $3\frac{1}{3}$  ounces) of a normal solution of **acid sodium phosphate**. The beneficial effects became noticeable 3 to 4 hours after the injection had been administered and lasted from 1 to 7 days.

**CHLORIDES.**—In an instructive and suggestive discussion of *chloride retention*, L. Ambard and F. Schmid (Paris méd., May 7, 1927) point out that when a protein is immersed in a solution of sodium chloride, the mineral element which fixes itself upon the protein is either the sodium or the chlorine, and never the entire compound, sodium chloride. Whether the sodium or the chlorine will be the one thus to become fixed will depend upon the hydrogen ion concentration of the solution. Ordinarily, in the body, it is the chlorine, in the form of hydrochloric acid, which will combine with the body proteins. Under abnormal conditions the amount of hydrochloric acid fixed to the proteins may greatly exceed the normal. Thus, in the case of the brain and the red blood corpuscles L. Blum has found the acid fixed sometimes doubled or even more. In the condition known as "dry retention of chlorides," chloride excretion exceeding chloride intake by 30 grams or more a day, without any corresponding change in the body weight, has been observed. This

phenomenon, formerly inexplicable (on the basis of chlorine retention in the form of sodium chloride) can now be accounted for since it is known that the chlorine is retained in a protein combination.

How can chlorine retention through protein combination be detected clinically? The writers call attention to a relation existing between such retention and the alkali reserve, and believe that detection of such retention is best carried out on this basis. It is well known that the bicarbonate of the blood plasma bears (except in some extreme cases) a constant ratio to the carbon dioxide in solution in the blood, this ratio being probably maintained by the kidneys. Now, the blood carbon dioxide is subordinate to the alveolar carbon dioxide, which is itself regulated by the pulmonary ventilation. It is in the pulmonary ventilation that the rôle played by the chlorine will appear. Hitherto it has been believed that it was the hydrogen ion concentration of the blood which regulated pulmonary ventilation, but this view the authors no longer consider sound, since it has become known that simple ingestion of sodium chloride, which does not increase the acidity of the blood, nevertheless increases pulmonary ventilation. For this and other reasons, it is to the amount of hydrochloric acid fixed upon the nervous system that they attribute the regulation of pulmonary ventilation. The greater the amount of acid fixed, the more will ventilation become accelerated, and *vice versa*. Under these conditions, a fall in the alkali reserve is taken to indicate an excess of protein-combined chlorine in the system. Clinical studies by Essen, Porges and Kauders, as well as by Ambard, Schmid and Adnot, have shown that ingestion of an excess of salt, when accompanied by chlorine retention at least partly in the condition of protein combination, is invariably accompanied by a fall in the alkali reserve.

In hyperchlorhydria, a salt-free diet is known to reduce the gastric secretion. One of the writers, with Enriquez, had investigated whether a relationship existed between gastric hypersecretion and the amount of chlorine in the blood plasma; no such relationship was found. The writers' present belief in this connection relates to



the fact that the irritability of the nerve centers varies with the amount of hydrochloric acid combined with them. To dechloridize an individual thus means to render his nerve centers less irritable and to reduce the secretory response of his stomach to given degrees of food stimulation.

Another pertinent fact relates to the marked gain of weight which some patients with "dry retention of chlorides" show when they are placed on a salt-free diet. This the authors would explain in that on an ordinary diet the proteins of these patients were charged to excess with hydrochloric acid, which acid brought about an excessive destruction of body proteins. The salt-free diet in such cases is followed by a marked restoration of the nitrogenous compounds of the body.

Sudden ingestion of an excessive amount of salt causes acute lesions in a normal individual. No edema results, but there is produced an acute nephritis attended with a temporary rise in the ureosecretory (Ambard's) coefficient. Hitherto this nephritis has been ascribed to "osmotic injury." The latter the authors consider as merely "words." Excessive ingestion of salt automatically causes an undue loading up of the tissues with hydrochloric acid, the harmful action of which cannot be doubted.

G. L. Boyd, A. M. Courtney and I. F. MacLachlan (Amer. Jour. of Dis. of Childr., Aug., 1927) have carried out detailed studies of the chlorides and sodium in 68 cases of all types of *nephritis*. Discussing the relation of the plasma chlorides to *edema*, they note that one of the earliest and most persistent explanations of the cause of edema has been that it was the result of chloride retention. Attention has been drawn to the almost constant hyperchloremia found in whole blood determinations and its frequent association with a low urinary output of the salts. More recent studies of blood chlorides, however, done on serum or plasma, have shown this concentration in edema to be variable. In 1905, Ambard showed that in certain cases of interstitial nephritis with high chlorides, chloride and water retention are dissociated. Such disagreement has been more recently reported by Bickel in cases in

which water intake was restricted and its loss increased. Blum and van Caulert believe the phenomenon to be of fairly frequent occurrence in interstitial nephritis, corresponding to the gravity of the condition. The presence of dry retention has been detected by these authors by examination of the blood chlorides and blood concentration (with the refractometer).

In 25 cases in which the writers carried out renal function tests, including the concentrating power, water excretion and diluting power and the phenolsulphonphthalein tests, no close agreement was noted between the response to these tests and the level of the blood chlorides, with the possible exception of the phthalein test. Most patients showing gross impairment in ability to excrete this dye had hypochloremia.

Among the writers' general conclusions are the following: The plasma chlorides in acute nephritis are usually at the upper normal level or definitely increased. In the acute glomerular type, they are high in 80 per cent. of the cases. Low plasma chlorides in this type of nephritis are rare and occur only in association with persistent vomiting. Increased chloride concentration is also present in over  $\frac{2}{3}$  of the cases of the acute hydremic character. In chronic azotemic nephritis, the level of the plasma chlorides falls as the disease progresses. In chronic parenchymatous nephritis the plasma chlorides may be normal or high. During accumulation of edema, in all types of nephritis, the plasma chlorides are normal or increased, and the blood concentration is apparently normal. Hypochloremia and hydremia characterize the dropsical state when it becomes established. As the edema is excreted, the plasma chlorides return to normal fairly rapidly. High blood-pressure is usually associated with hypochloremia. Retention of both sodium and chlorine, as measured by balance experiments, occurs in all types of hydremic nephritis. Such retention is associated with high plasma chlorides unless the latter have been reduced by vomiting.

**CHLOROFORM.—PHYSIOLOGIC ACTION.**—E. Frommel (Schweiz. Med. Woch., July 16, 1927) holds that the pharmacodynamics of chloroform are too

much neglected. Thus, he contends that **atropine** might prove useful by reducing the irritability of the vagus during the first stage of anesthesia and its dangers. **Scopolamine** and **morphine** proved practically useless in this direction, although they increased the anesthetic effects of the chloroform. Their rôle in this connection should be studied.

Lucchetti (Prat. méd. franç., Mar., 1927) calls attention to the **dangers of adrenalin injections into the nasal mucosa** during chloroform anesthesia and cites several fatal results following this procedure in the operating room. A study of the problem in dogs showed that while adrenalin injections made *before* chloroform anesthesia were devoid of danger, there was danger, though slight, in placing tampons of adrenalin solution on the nasal mucosa and in giving hypodermic injections of adrenalin *during* anesthesia. There was great danger in injecting adrenalin solution *into* the nasal mucosa during chloroform anesthesia.

While the result was eventually fatal, a case observed by Bianchetti (Rif. med., May 24, 1926) illustrates what persistence in the resuscitative measures will sometimes accomplish. The patient, a man with metastases of carcinoma, stopped breathing after inhalation of a few cubic centimeters of chloroform. The heart-beat stopped shortly afterward. Artificial respiration and subcutaneous injections were of no avail. He injected 1 c.c. (16 minims) of a 0.1 per cent. solution of **adrenalin** into the heart and while maintaining the artificial respiration, gave 25 minutes later another injection of 1.5 c.c. (23 minims) of adrenalin, and 1 c.c. of a 25 per cent. solution of **caffeine**. The patient still did not react. They kept on with the respiration. A third injection of 2 c.c. (32 minims) of the adrenalin, given 35 minutes after the onset of the syncope, resuscitated the patient. He did not regain consciousness, however, and died in a few hours.

**CHOKED DISC.**—Recalling that the 3 dominant factors which probably, according to the exhaustive researches of Leonard

Hill on the cerebral circulation, underlie the production of choked disc are the arterial circulation, both intracranial and intraocular; the venous circulation, particularly the intracranial, and to a lesser degree the cerebrospinal fluid circulation, G. W. Swift (Northw. Med., Dec., 1927) concludes a study of the subject as follows: Papilledema is always either the direct or indirect result of a damming-up of the return venous blood from the eyeball. The time of its appearance depends upon the location of the tumor and occurs in the following sequence: (a) Cavernous sinus, (b) petrosal sinuses, (c) lateral or transverse sinuses, (d) occipital fossa, (e) parietal fossa, (f) frontal fossa, (g) central nuclei. Direct pressure, as against the petrosal or cavernous sinuses, causes early choked disc, while indirect pressure, as in edema of the brain, or dilated lateral and third ventricles or both, causes late choked disc. The cerebrospinal fluid plays but an indirect part in the causation of choked disc, and then only by increasing the general intracranial pressure and not by direct extension into the disc from the sheath of the optic nerve.

**CHOLECYSTITIS.—DIAGNOSIS.**—The bulk of attention in connection with this disorder has been centered upon *cholecystography*, a method introduced by E. A. Graham and W. H. Cole in 1924 (see the 1925 Supplement, p. 355), making possible the visualization of the gall-bladder in the course of a roentgenologic examination, upon intravenous injection of an opaque compound which, being largely excreted with the bile, is readily seen, much as is the case with a barium meal in the course of its progress along the alimentary canal. The dye used was the *sodium salt of tetrabromphenolphthalein*, 4.5 or 5 Gm. (68 to 75 grains) being dissolved in 35 to 40 c.c. ( $1\frac{1}{6}$  to  $1\frac{1}{3}$  ounces) of freshly distilled water, filtered, and sterilized by heating in a boiling water bath for 15 to 20 minutes. This

dose was administered intravenously in 2 doses  $\frac{1}{2}$  hour apart before breakfast, between 7.30 and 9 A.M., the dose being somewhat reduced for persons weighing less than 125 pounds. Both breakfast and lunch are to be omitted, though for the latter, a glass of milk may be taken. The evening meal should contain no protein. During waking hours the patient is to take 2 Gm. (30 grains) of *sodium bicarbonate*. Roentgenograms are then taken 4, 8, 24 and 32 hours after the intravenous injection. In about 25 per cent. of the cases, transient dizziness, nausea, and perhaps vomiting, body pains and fall of the blood-pressure were promptly relieved by 0.5 to 1 c.c. (8 to 16 minims) of *adrenalin* intravenously. A correct, verified, diagnosis of cholelithiasis with or without gall-stones was obtained by the writers, even in very early cases.

The more recent observations in a large number of cases dealt with by various clinicians have shown that the *oral* method is to be preferred to the intravenous. Thus, J. A. Saralegui (Arch. Arg. de Enf. del Ap. Dig., ii, 640, 1927), after trying the method in 1124 cases, extols the advantages of the oral route. The results—visualization in 94 to 96 per cent.—were practically the same as with intravenous administration. The examination should be made 12, 16, 20 and 32 hours after ingestion of the dye, and be repeated until all the pertinent details are secured. With proper technic there is no danger. In many cases the condition of the duodenum could be determined at the same time. It should be noted, however, that Saralegui (Amer. Jour. of Roentg. and Radium Ther., Dec., 1925) prefers the iodine salt because

it is twice as opaque to the roentgen ray as the bromine salt. Hence, 30 per cent. less of the salt needs to be used to get the same results. He used 0.045 Gm. ( $\frac{3}{4}$  grain) per kilogram ( $2\frac{1}{5}$  pounds) of body weight in 10 per cent. solution in freshly distilled water. His results were excellent. Mackoy (Wis. Med. Jour., Aug., 1926) also deems the oral administration of the *sodium salt of tetraiodophenolphthalein* as the safest and most practical method for routine use. McEvedy and Sheret (Lancet, May 28, 1927) likewise found that cholecystography after the oral administration of sodium tetraiodophenolphthalein gave a correct diagnosis in 92 per cent. of cases controlled by operation.

Kirklin and Kendall (Radiol., Sept., 1927) used for cholecystography a new iodine compound—a 10 per cent. aqueous solution of the *sodium salt of di-iododiethyl-ether of disalicylphthalein*—in 35 patients. A normal shadow of better density was always obtained with this iodine preparation. None of the patients vomited the new compound, although several had vomited after taking the tetrabromophenolphthalein. Two patients were purged unpleasantly; one of these had recently had diarrhea and the bowel was still irritable. A few patients experienced a slight laxative effect, but without diarrhea or discomfort.

While the oral administration of tetraiodophenolphthalein is also preferred by Levyn and Aaron (Amer. Jour. Roent. and Rad. Ther., Dec., 1927, and N. Y. State Jour. of Med., Mar. 1, 1928), they recommend, in order that it be evenly distributed, a mixture with *grape juice*. The disodium tetraiodophenolphthalein, 3 Gm.

(45 grains), is dissolved in 1 ounce (30 c.c.) of water, care being taken to guard against any lumping by filtering the solution. To this is added from 8 to 10 ounces (235 to 300 c.c.) of a standard grape juice which precipitates the free acid in a very finely divided fresh state. The resulting mixture is almost palatable and very well relished. The finely divided free acid is readily converted into the soluble salt by the duodenum and excellent cholecystograms are obtained.

Morris (Brit. Med. Jour., Feb. 25, 1928) mixes tetraiodophenolphthalein, 5 grains (0.3 Gm.) per 10 pounds (4½ kilograms) of body weight, with *white of egg* before adding it to cooked cream of wheat (about 4 ounces—120 Gm.). His purpose is to fix the salt until it has passed through the pylorus. The method proved effective.

The results of cholecystography, on the whole, have been very satisfactory. The gall-bladder was removed and examined microscopically by Graham (Surg., Gyn. and Obst., Feb., 1927) in 147 cases. In 143 the X-ray diagnosis was confirmed, showing a percentage of correctness of 97.28. The oral administration of sodium tetraiodophenolphthalein is being carried out at Peter Bent Brigham Hospital for cholecystography in the form of pills coated with salol in syrup of tolu by Whitaker, Milliken and Vogt (Surg., Gyn. and Obst., June, 1925). The oral method was used first in cases suspected of gall-bladder disease, then followed by the intravenous method in a few instances when the result with the former was not conclusive. The oral method relieves many patients of the

hospitalization necessary for the intravenous method, and causes them very little inconvenience.

In 100 cases examined by J. Brams, K. A. Meyer and W. A. Brams (Radiol., Jan., 1926) following the oral administration of tetraiodophthalein sodium, 43 were proved at operation to correspond with the roentgenologic diagnosis, and the remaining 55 corroborated the clinical diagnosis. In 2 surgically proved cases the roentgenologic diagnoses were wrong. All untoward effects were eliminated by reducing the dose of the salt to about 50 grains (3.24 Gm.).

Boardman and McKenzie (Cal. and West. Med., Jan., 1926) used cholecystography in 109 cases; in 4 the dye was given rectally. Rectal administration was soon abandoned, as the degree of absorption was too uncertain and considerable rectal irritation was produced by the dye.

A few clinicians have recorded more or less *untoward effects*. In a series of 475 cases, Camp, Reeves and Field (Boston Med. and Surg. Jour., May 27, 1925) tried both the intravenous and oral methods. When given intravenously, sodium tetrabromphenolphthalein produced such a reaction that its use in this manner was not deemed safe. It was thus given, however, without a severe reaction in 72 cases. About ⅓ of these patients experienced some nausea or vomiting. It was given in plain gelatin capsules by mouth in 334 cases. Sixty-seven per cent. of these patients experienced some nausea; 31 per cent. complained of varying degrees of vomiting. The oral administration in coated or hardened capsules and pills did not give consis-



tent results. Many of these failed to dissolve, and the resulting shadows were not reliable. Their use did not eliminate nausea and vomiting.

Dick and Wallace (Brit. Jour. Surg., Jan., 1928) also hold that the use of sodium tetraiodophenolphthalein in diagnostic doses is not free from risk in certain circumstances, its experimental introduction into the pancreatic duct being sufficient to produce acute pancreatitis. In cases of cholelithiasis in which stones are present in the common bile duct and the conditions are otherwise favorable for the retrojection of bile into the pancreas, the danger of acute pancreatitis occurring would be increased if the regurgitated bile contained the phenolphthalein salt. In obstructive jaundice the normal route of elimination of the drug is unavailable, and small quantities are excreted in the pancreatic juice. In animals with experimental biliary obstruction, especially in rabbits, it was found that pathologic changes occurred in the pancreas, ranging from simple vascular congestion to hemorrhagic pancreatitis. This affords support for the opinion that the toxicity of the drug on this organ is greater when biliary obstruction is present. No ill effects apparently ensue in the normal kidney.

Counteracting apparently the so-called dangers of cholecystography, a collective investigation by Feldman (Ann. of Int. Med., Aug., 1927) in 18,000 cases in which cholecystography was resorted to, the dye being administered by the oral route, showed that this method is free from all danger. Furthermore, there has been presented no evidence to indicate that any degenerative changes

have been produced in the liver or kidneys by this procedure.

**PATHOLOGY.**—Wilkie (Brit. Jour. of Surg., Jan., 1928), in a painstaking study of the bacteriology of 50 consecutive cases of gall-bladder disease submitted to operation, found that in the vast majority of cases of chronic cholecystitis the bile was sterile on culture. Cultures from the submucous and outer coats, leaving the mucosa intact, however, gave a growth of streptococci in 42 per cent. of cases. Bile was found to inhibit the growth of this streptococcus. The cystic gland in cases of cholecystitis yielded a growth of streptococcus in 86 per cent. of cases. *B. coli* was recovered from the bile in only 6 per cent. of cases. Experimental studies tend to prove that cholecystitis is a blood-borne streptococcic intramural infection.

**TREATMENT.**—Allard (Zent. f. inn. Med., Apr. 10, 1926) resorts to surgical measures in cholecystitis, gall-stones, or occlusion of the common bile duct, only when medical duodenal treatment fails. He injects in the evening **pituitary extract** intramuscularly (to empty the gall-bladder), and gives afterward 1 mgm. ( $\frac{1}{65}$  grain) of **atropine** with some **cholagogue**. On the next day, he introduces the **duodenal tube**, and provokes the reflex again. He follows this with injection of 100 to 300 c.c. ( $3\frac{1}{3}$  to 10 ounces) of a 15 per cent. solution of **magnesium sulphate**. Profuse diarrhea follows, but some of the gall-stones may appear in the stool after the 2d day. The injection brings on a colic which he mitigates by **papaverine**, **atropine** or **scopolamine**. He repeats the treatment every 4th to 8th day. He never wit-

nessed any bad effects in his 200 cases thus treated in the last 2½ years. Empyema of the gall-bladder is, of course, a contraindication to this treatment.

According to B. B. V. Lyon (Med. Jour. and Rec., Dec. 7, 1927), when cholecystitis is recognized early and treated on a comprehensive non-surgical basis, with sound dietetics and appropriate therapy by the mouth, the **eradication of removable foci of infection**, the use of **vaccines** prepared from such foci, and intensive **drainage** of the biliary tract, cure can be effected and the gall-bladder restored to normal. Cases of surgical gall-bladder, with recognizable gross pathology and destroyed function, should be referred for a **cholecystectomy** when possible. The practice of surgical drainage of the common duct, except in the presence of stricture or other obstructive lesion, should be discontinued and replaced by **drainage with the duodenal tube**, which is safer and often more effective. All operative cases should have a short period of **pre-operative non-surgical drainage** to prepare the operative field and aid in detoxicating the patient by lifting some of the load from the liver, heart and kidneys, and also a period of **post-operative non-surgical drainage**, when necessary, to take care of residual hepatic or duct inflammations or infection and prevent a relapsing cholangitis.

**CHOLELITHIASIS.—DIAGNOSIS.**—Meulengracht (Arch. of Int. Med., Feb., 1925) stresses the diagnostic value of *jaundice*, provided the slight or occult degrees are searched for. A considerably larger propor-

tion of cases than is generally believed will then be found to be accompanied by slight transient jaundice. It is especially useful in differential diagnosis. The patient should be instructed in doubtful cases to send for the doctor when there has been an attack of pain, so as to afford him an opportunity of investigating whether jaundice in any of its manifestations is present in direct association with the attack.

While Dahl-Iversen (Hospitalltid., June 3, 1926) found the secretion in the stomach within the normal range in 69 per cent. of his 128 gall-stone operation cases, there was hypochylia in 22 per cent. and achylia in 9 per cent. He failed to find any evidence that removal of the gall-bladder has any influence on the secretory function of the stomach, or that an impacted gall-stone in the cystic duct induced reflex achylia. He concludes that the impaired gastric secretion may be observed with gall-stones as the result of increasing age, not of the lithiasis. On the other hand, in an examination of 80 cases, Orator and Knittel (Deut. Zeit. f. Chir., May, 1926) found a high pepsin value in cholelithiasis as well as in ulcer cases, in functional gastric disturbances, or after gastroenterostomy.

Piersol, Bockus and Shay (Amer. Jour. Med. Sci., Jan., 1928) found a characteristic pigment, the bilirubin calcium pigment or *calcium bilirubinate*, in the bile drained from the duodenum, with sufficient constancy to give it significance in the diagnosis of gall-stones. In 42 cases of cholelithiasis in which there was pre-operative drainage, 73.8 per cent. showed this pigment or cholesterol or both in the bile obtained from the

duodenum. All the cases showing cholesterol crystals and pigment in the bile obtained by biliary drainage proved to be cases of gall-stones.

According to Janker (Deut. Zeit. f. Chir., June, 1927), *diastase* values in the blood and urine very much above normal point to involvement of the pancreas. The more or less complete absence of diastase in the stool indicates the degree of functional insufficiency of the gland

**COMPLICATIONS.**—*Pyloric stenosis* was observed as a complication in cholelithiasis by Troell (Ann. of Surg., Nov., 1927). In 1 case there was a history of gall-stones. Vomiting in the nature of retention indicated operation in both cases; this was undertaken in the 1st place because of suspected cancer. A gall-stone and a perforated gall-bladder were found in communication with an abscess the size of a lemon, located between the liver and the stomach and duodenum. Gastroenterostomy was done, but the patient died 3½ weeks later from pneumonia. In his 2d case, many gall-stones were found in addition to a small and shrunken gall-bladder which communicated by means of a perforation in a protuberant part of its lower wall with the most proximal portion of the small intestine. Traction, due to inflammatory shrinkage, had caused the pyloric region to become stenosed. After removal of the accessible part of the gall-bladder, the duodenal wall was sutured and gastroenterostomy done, and recovery ensued.

According to statistics elaborated by Lentze (Beitr. z. klin. Chir., cxxxvii, 38, 1926), 557 cases of gall-stones showed cancer of the gall-bladder in 5.1 per cent. of women

over 39 years of age. For both sexes taken together the percentage was 4.3. He holds that cholelithiasis was in all probability the primary cause.

**PATHOLOGY.**—In 392 autopsies in adults, S. Hansen (Hospitilstid., Mar. 11, 1926) found gall-stones in 24.7 per cent., and 2 or more gall-stones in the liver itself in 7 instances, the ages ranging from 68 to over 80. In 6 cases the bile ducts were more or less obstructed, but in 1 man of 80 small, pure pigment calculi were found in the liver and also in the gall-bladder and cystic duct. The bile was sterile, and nothing was found in the anamnesis or at necropsy to suggest stasis of bile at any time. In some of the others there was cholesterol with the pigment in the intrahepatic calculi. Some of the intrahepatic calculi were faceted; this disproves the theory attributing faceting to the presence of the gall-bladder.

Hansen (Acta chir. Scand., Dec. 24, 1927) recalls that the greatest number of gall-stones in man consist mainly of cholesterol, while recently formed stones are made up almost entirely of this monatomic alcohol. He holds that the cause of gall-stone formation should be sought in an abnormal composition of the bile and not in any local conditions of the bile tracts. Experiments *in vitro* and *in vivo* showed that cholesterol is precipitated from the bile, and that infection plays no part in the process. By increasing the quantity of cholesterol in the blood of rabbits through feeding them on cholesterol and in other ways, the cholesterol content in the bile is increased. In such animals cholesterol is precipitated in the gall-bladder partly as isolated crys-

tals and partly as crystals clumped together in a way never found in normal animals. Narrowing the cystic duct or the gall-bladder in rabbits with cholesteremia results almost constantly in the formation of cholesterol concretions, while the same procedure in normal animals may cause pigment, but not cholesterol, to be precipitated. Typical mixed gall-stones were never obtained. In patients suffering from gall-stones, one often finds a cholesteremia which may reasonably be attributed to impairment in the function of the suprarenals or ovaries.

In a study of the pathogenesis of *biliary colic*, Chiray and Pavel (Presse méd., Feb. 10, 1926) found that a migrating gall-stone, foreign body or inflammation of the gall-bladder does not induce biliary colic, but only favors its appearance. Spasmodic contraction of the gall-bladder, from excessive stimulation of the vegetative system, is the determining factor of the colic. The pain is paroxysmal and appears suddenly, occurring sometimes under the mere influence of an emotion, *e.g.*, grief, in the absence of a gall-stone or foreign body; the pain is of short duration at times—less than an hour, sometimes only a few minutes. Experimental contraction of the gall-bladder with painful paroxysm from injection of magnesium sulphate into the duodenum is also suggestive of the neuro-spastic origin of hepatic colic.

A study of 612 autopsies at the Mayo Clinic by S. H. Mentzer (Surg., Gyn. and Obst., June, 1926) revealed visible pathologic changes in the gall-bladder in 66 per cent. There were microscopic changes in 75 per cent.

Of the deaths, 7.7 per cent. were due to disease of the gall-bladder *per se*. Eight per cent. of the gall-bladders showed only minor indications of inflammation. In non-inflammatory disorders of the organ—38 per cent. of the whole series—the author ascertained the presence of what he terms a “cholesterosis.” In 82 per cent. of the women who had been pregnant, gross lesions of the gall-bladder were present, but 64 per cent. of these showed cholesterosis only. It was especially present in obese women—those weighing 210 pounds (95.2 kilos.) showing cholesterosis in 70 per cent.

**PROPHYLAXIS.**—According to Hurst (Lancet, May 22, 1926), it is impossible to tell when a gall-stone is beginning to form. It is wise, therefore, to give all patients with active cholecystitis a diet poor in cholesterol. In addition to cream and the yolk of eggs, brain, liver, sweetbread, kidneys and roe should be avoided, and all forms of animal fat be taken in strict moderation. As many of the patients are obese, this diet has the further advantage of helping them to lose weight.

According to R. J. Eldridge (Bull. Wayne Co. [Ill.] Med. Soc., Jan. 10, 1928), olive oil is a fat very poor in cholesterol which will help, when given before meals, to empty the gall-bladder. It is especially indicated in cases of hyperchlorhydria.

**TREATMENT.**—Out of 187 cases of gall-stones treated by washing out the calculus or calculi with the duodenal sound, Matsuo (Deut. Arch. f. klin. Med., Aug., 1927) cured 54 (or 30 per cent.) and improved 67; in all, 60 per cent. were favorably influenced. The stone is easily washed



out. In Japan, however, due to the nature of the food, the soft pigmented calculus is more common than the hard cholesterol lime stone, while in Europe the latter is more often seen. The soft pigmented stone is more readily dislodged. Again, in Japan, stones are generally in the chole-dochus, whence they are more easily washed out. The usual instillation dose was 40 c.c. ( $1\frac{1}{3}$  ounces) of a 33 per cent. **magnesium sulphate** solution. Often the simultaneous injection of **pilocarpine** and **solution of pituitary** enhances the action of the duodenal treatment. If severe diarrhea follows the treatment, the author administers 5 per cent. **peptone and whole milk**, which at the same time builds up the patient's strength.

After examining 184 patients from 2 to 7 years after the beginning of internal treatment for gall-stones in Küttner's clinic, Löwenberg, Noah and Scherk (Deut. med. Woch., Dec. 9, 1927) found that 39 per cent. were wholly or almost wholly symptom-free, 21 per cent. had constant and severe symptoms, and 40 per cent. suffered pain occasionally but were in general satisfied with their condition. Of the uncured, 80 per cent. had kept to a more or less strict diet, while 75 per cent. of those free of symptoms had not held to a diet, thus showing that the resumption of normal living had not brought on a recurrence.

In an experimental study, Fujimaki (Japan Med. World, Feb. 15, 1926) found that animals kept on a protein and vitamine A deficiency diet formed concretions in a relatively short period, a shorter time than the animals fed on either a vitamine A deficiency or a vitamine A and C deficiency diet. Animals fed on a protein deficiency

diet died and did not form calculi. Animals fed on a vitamine A and inorganic phosphorus and calcium deficiency diet formed calculi in a very short time.

The following treatment of acute *biliary colic* is advocated by C. S. Webb (Med. Jour. and Rec., Aug. 17, 1927): The patient is given:

R *Chloroformi* ..... f3j (4 c.c.);  
*Ol. olivæ*,  
*Mucilag. acaciæ* ... āā f3ij (60 c.c.).

M. Sig.: Shake well. One or 2 teaspoonfuls every 4 hours.

The doses may be varied as to amount and interval if the conditions seem to require it. After finishing the above mixture the patient fasts 10 or 12 hours before taking the following:

R *Spts. ætheris comp.* .. f3j (4 c.c.);  
*Ol. olivæ*, f3viiij (240 c.c.)

M. Sig.: Shake well and take at one dose.

The patient is then made to lie on the right side, with the hips slightly elevated (about 4 inches) for 1 hour; then on the left side with the hips elevated about 12 inches, the spinal column being kept as straight as possible. This position is kept, if possible, for  $1\frac{1}{2}$  hours. Thereafter the patient may sit up or walk around the room. After 2 or 3 hours a full dose of **castor oil** is given and results awaited, the discharges being all saved, well diluted and strained through a wire sieve.

**SURGICAL TREATMENT.**—A study by Jaguttis (Mitteil. a. d. Grenzgeb. der Med. u. Chir., xxxix, 255, 1926) of the fate of 260 patients treated at the Internal Clinic at Königsberg in the years 1900-1914 showed that to widen the present indications for surgical treatment of gall-stones is unwarranted, especially

in view of the fact that a trial of conservative treatment is just as advisable as before. Only about  $\frac{1}{2}$  of the patients have their first attack before they are 40 years of age. After this age, the danger of surgical intervention is considerable. Large amounts of berries, currants especially, when regularly taken, are helpful.

Rowlands (Pract., June, 1926) holds that operations for gall-stones are very difficult and should not be undertaken lightly. Any one who undertakes this work should train himself thoroughly under a master. The main ideals are to do no harm and to remove all the stones, for they very rarely reform. Whenever possible, if the disease is limited to the gall-bladder, especially in young persons, it is important to remove rather than to drain the gall-bladder.

At the Charité, according to Dührssen (Arch. f. klin. Chir., Mar. 31, 1927), **operation** is resorted to after the first attack, if gall-stones have been diagnosed with certainty. During the attack, conservative remedies are used, and about 8 days after the disappearance of the last symptoms, operation is done. Perforation into the peritoneal cavity, icterus with grave acute infection, and involvement of the peritoneum in severe acute cholecystitis are regarded as absolute indications for operation. The mortality in 600 operations, including desperate cases and cases of recurrence, was 10 per cent. In simple **cholecystectomy** done in the interval, it was 4.9 per cent.; in **cholecystectomy with drainage** of the ducts, 7 per cent. The results of early surgical intervention in young patients were much better.

Sir Crisp English (Lancet, June 4, 1927) urges thorough examination of all neighboring parts, especially the stomach and duodenum, before the gall-bladder is surgically attacked. Too often a chronic duodenal ulcer is found at operation to account for symptoms confidently ascribed to gall-stones. In the cases in which the wisdom of **cholecystectomy** is doubtful after thorough examination of the whole biliary system, the writer is in the habit of performing an operation which is a compromise between cholecystectomy and cholecystostomy. The gall-bladder with its contents is removed at its junction with the cystic duct and then, instead of closing the duct, a drainage tube is put into it. Thus the advantages of excision and drainage are combined, and the operation is often a much safer one than the ordinary excision and closure. It involves a slight risk of leaving raw surfaces, and this part of the operation requires very careful attention.

Anschutz's (Deut. Zeit. f. Chir., Mar., 1927) statistics show that older persons can be **operated** on for gall-stones without great danger if the operation is done in the interval, *i.e.*, when neither icterus nor fever is present. The dangers of the operation lie not so much in the age of the patient or the long standing of the disease as in retention of bile and acute infection.

The case of a woman who had been operated on in 1924 for gall-stones was observed by Hall (Brit. Med. Jour., Dec. 3, 1927). In September, 1927, she had a definite attack of colic. The gall-bladder was then removed. On opening the latter, 2 stones were found inside which had formed around the purse-string suture in-

serted at the first operation, the suture running through the whole length of the stone.

**CHOLERA ASIATICA.**—In an outbreak of Asiatic cholera in Shanghai, not less than 20,000 cases occurred, according to Lien-Teh, Chun and Pollitzer (Nat. Med. Jour. of China, Dec., 1926), while Siam reported over 5000 deaths from this disease. A restricted outbreak occurred also in the Philippines, the cases as reported by Lara (Amer. Jour. of Hyg., Sept., 1927) being due to the infection of a spring used for drinking purposes. The mortality was exceptionally high despite the fact that out of 24 patients, 23 gave a history of anticholera vaccination, in the great majority less than 4 months before.

Sata (Deut. med. Woch., June 17, 1927) reports a case of laboratory infection with cultures of *vibrio cholerae Asiatica* which had been isolated 1½ years before. The patient, Dr. Matsusaki, had used all possible precautions.

**PATHOGENESIS.**—On the basis of a study of films from more than 60 cases of cholera, Palmer (Indian Med. Gaz., Apr., 1927) concluded that there was no evidence that the comma bacillus plays any rôle in the causation of the disease. In Cachar it appears to be associated with a small coccobacillus which often assumes a bipolar staining form. Whether this is identical with the small spore-bearing bacillus is not yet certain. The other organisms found, such as spirochetes, are inconstant, and may be but secondary growths in rice water fluid of organisms which find conditions suitable for their rapid growth. The etiology has been traced in some instances to pig's feces.

Tomb and Maitra (Indian Med. Gaz., Feb., 1927), by means of the "open-bowel" method, found that in many localities of an endemic area 35 per cent. of the inhabitants were carriers of non-agglutinating vibrios. The identity of agglutinating and non-agglutinating vibrios found in cases of clinical cholera, while proving that the 2 vibrios were allied serologically, could not be shown conclusively. The stools of convalescent patients showed that 80 per cent. became chronic carriers of non-agglutinating vibrios, the agglutinating form permanently disappearing in from 2 to 4 weeks. In examinations of thousands of stools, the authors have been unable to discover 1 permanent carrier of agglutinating vibrios.

Wu-Lien-Teh, Chun and Pollitzer (Nat. Med. Jour. of China, Dec., 1926) call attention to the fact that after the Chinese authorities had introduced modern methods for the control of cholera, a marked reduction in the mortality occurred in the hospital with which the authors were connected. While, in the Municipal Hospital, in which the other methods prevailed, the deaths reached 54.5 per cent., in their own hospital it was but 17.3 per cent.

**TREATMENT.**—Sajous, in 1903, pointed out the striking similarity between the symptoms of Asiatic cholera and those of failure of the adrenals. Since then various observers, *e.g.*, Drake Brockman (1910), Piovesana (1912), and Naamé (1914), have emphasized the same kinship and used **adrenalin** in **saline solution**, cholera victims bearing large doses of the former, as well as relatively large quantities of saline solution to

compensate for the great loss of serous fluid in the stools. S. T. Velukannu (Pract. Med., Aug., 1927) found **adrenalin chloride** in the 1:1000 solution the most effective remedy in a recent epidemic, administering 2 c.c. (32 minims) at the first injection and 1.5 c.c. (23 minims), repeated 1 or more times, at 12-hour intervals. Even in 2 patients *in extremis*, among the 15 treated, in which both the adrenalin and saline solution were used, recovery ensued.

Rogers (Roy. Soc. of Med. and Hyg., Apr. 27, 1927) found that **hypertonic saline solution** alone reduced the mortality 45 per cent., while with the addition of **potassium permanganate** it was reduced by over 65 per cent.

The value of *blood-pressure readings* as an aid in the treatment of cholera is brought out by A. J. V. McDonnell (Jour. of Trop. Med. and Hyg., Dec. 1, 1927). All of the 15 cases studied received **intravenous hypertonic saline infusions** and **potassium permanganate** pills at intervals as recommended by Rogers. During an infusion, blood-pressure readings should be taken after every pint infused and as often as possible thereafter until the patient is out of immediate danger. The differential or pulse pressure was found of especial significance. A pulse pressure below 20 mm. Hg indicates the need of a further infusion. During an infusion, an increase of less than 4 mm. Hg in the pulse pressure over the previous reading implies that the infusion should be discontinued. The typical divergence of systolic and diastolic pressures occurred in 24 out of 25 infusions where the hypertonic saline was infused without addition of other

drugs. After 5 out of a total of 32 infusions a rigor occurred at the end of or after an infusion; in each of these 5 cases the pulse pressure had remained constant or almost constant for the last 2 or more readings. Thus, it would appear that rigors result from overinfusion, and not from improper temperature of the fluid infused. The effect of each rigor was, according to its severity, to produce a sharp fall in the systolic pressure. The blood-pressure readings assist in preventing harmful overinfusion. One earlier case that died might have recovered had he not been overinfused at 1st, causing a severe rigor.

According to Cannon (China Med. Jour., Dec., 1926), both Shameen and Canton were saved from a severe epidemic of cholera by the **Tomb treatment**, in which an essential oil mixture is used, made up thus: **Spirits of ether**, 30 minims (2 c.c.); **oil of cloves**, **oil of cajuput** and **oil of juniper**, of each 5 minims (0.3 c.c.), and **aromatic sulphuric acid**, 15 minims (1 c.c.). The dose is 1 dram (4 c.c.) in  $\frac{1}{2}$  ounce (15 c.c.) of water, every  $\frac{1}{2}$  hour. The average amount required is about 1 ounce (30 c.c.). One dram in  $\frac{1}{2}$  ounce of water, daily, is said to be a preventive. Tomb and Thompson (Proc. Roy. Soc. of Trop. Med. and Hyg., Apr. 27, 1927) dispute the teaching of Rogers that **opium** is contraindicated in the early stages of cholera, an expectant policy being followed until collapse has appeared and **saline injections** become imperative. They deem it proven that treatment solely by carminative cholera mixtures, generally containing opium, will reduce the mortality from the 90 per cent. of wholly untreated cases to about 50 per cent.



**CHOREA.**—The relative importance of *emotional disturbances* of irregular type in choreic children is emphasized by F. G. Ebaugh (Jour. Amer. Med. Assoc., Oct. 2, 1926). These disturbances may incapacitate the child, and assume even greater significance than the well-known motor symptoms. In 32 choreic school children studied, emotional lability was the most constant observation. Children suddenly became irritable, extremely sensitive, abusive, and sometimes violent. Temper outbursts were frequent, and outbursts of depressive nature sometimes seen. Many appeared apathetic, restless and indifferent. Silly, causeless laughter was noted, and insomnia, night terrors and sleep walking occurred prominently. A majority showed fatigue with inability to concentrate. Delinquency occurred in 21.2 per cent. Etiologic factors seemed to point clearly toward toxic and infectious agents. Hereditary influences were noted in 43 per cent. Following removal of the cause, *e.g.*, foci of infection, choreiform twitchings may continue as a habit and should have treatment from a psychiatric standpoint. In the writer's cases treatment consisted of **rest, isolation, removal from school**, efforts to **instill self-confidence** in the children, and **avoidance of discussions and oversympathy** by the parents. **Tryparsamide** in doses of 1.5 to 3 Gm. at weekly intervals for a course of 6 injections proved of value in the several instances in which it was used, causing a gain in weight and improvement in the blood-picture.

**TREATMENT.**—Having treated a series of cases with various measures, H. L. Dwyer (South. Med.

Jour., Feb., 1926) concluded that **magnesium sulphate** in 25 per cent. solution given **intramuscularly** has a definite sedative action in the majority of instances. **Typhoid vaccine**, containing 20 to 30,000,000 killed typhoid bacilli in each dose, is often beneficial in the long-continued mild case or the case in which the most marked symptoms have disappeared and some residual chorea persists. The **autoserum** therapy gave good results in the few instances in which it was tried. **Horse serum** introduced **intrathecally**, as advocated by Porter, gave good results in few instances, and no results in many others. The use of **salicylates** is thought beneficial only when there is evidence of an active rheumatic infection. **Chloral hydrate** and **bromides** are often necessary in the severe cases.

In the case of a girl of 9½ years reported by J. Burnet (Lancet, Mar. 19, 1927), violent choreic movements ceased almost as soon as **treatment for tapeworm** was given and the worm passed. The patient was definitely rheumatic, yet could not have recovered from the chorea had arsenic treatment alone been given. It is important in chorea to remember that, in addition to the rheumatic constitutional disease, there is an **exciting cause**, such as school strain, approach of puberty, fright, or intestinal parasites. Such factors must be discovered and **counteracted** before treatment of the chorea itself is undertaken. **Acetylsalicylic acid** is to be preferred to **sodium salicylate**, being less likely to produce symptoms of acidosis. To a child of 10 years not less than 10 grains (0.6 Gm.) of either drug should be given 3 times daily or every 4 hours, according to

the severity of the attack. With sodium salicylate an equal quantity of **sodium bicarbonate** should always be given. **Arsenic**, if used, should never be pushed; doses of 3 to 5 minims (0.2 to 0.3 c.c.) of **Fowler's solution** should not be exceeded. **Chloral hydrate** seems to act best where the sleep function is disturbed, and is preferable to **bromides**. Sometimes, especially in younger children, **antipyrin** may be tried, but its effects must be carefully watched. **Calomel** is of special value where the heart is seriously involved.

In the **diet**, soups, eggs, custards, farinaceous foods, porridge, fish, chicken, jellies and fruit are all of value. Toast and bread with butter or marmalade may be allowed. The heart must be examined at every visit, not only by auscultation, but also by light percussion, which usually reveals dilatation long before a murmur can be heard. Very often 6 weeks of **rest in bed** is not too long a period. Gentle, stroking **massage** not only keeps up nutrition of the limbs but actually aids in checking the choreic movements if regularly carried out. It should be practised twice daily; massage in the evening often improves sleep. During convalescence 5 grains (0.3 Gm.) of one of the salicylate group, along with 5 or 10 grains of the **saccharated carbonate of iron**, should be given thrice daily for several weeks. **Nux vomica** and **cod-liver oil** are also of value. Return to school should be delayed for 3 to 6 months. The heart should be re-examined every 6 months.

Injections of **Pregl's iodine solution**—an aqueous solution of iodine and salts of iodine from which iodine is set free—are advocated by H.

Brasch (Arch. f. Psych., lxxxi, 2, 1927). The injections, usually intravenous, are given at intervals of 2 to 5 days. Slight fever, headache and nausea may result, and occasionally coryza and a rash. Under this treatment the disease generally runs its course in 4 to 6 weeks. **Arsenic** may be added with advantage.

**CHOROIDITIS.**—De Saint-Martin (Médecine, Jan., 1927) lays stress on the marked improvement or cure obtainable in *myopic choroiditis* by the use of **mercury**, independently of the presence or absence of syphilis. In early cases, mercurial treatment is very likely to yield a complete cure without any persisting lesions of the choroid that would permanently impair vision. In 2 out of 4 cases described **mercury cyanide** was used intravenously, in another **enesol**, and in the 4th, **mercurial inunctions**. In 3 cases a central scotoma and macular focus disappeared under the treatment, and in the 4th, slight distortion of objects and words alone persisted. The intravenous injections are preferred to the inunctions. In 2 cases 20 such injections were given.

**CINCHOPHEN.—POISONING.**—According to recent observations, cinchophen is not as free of the risk of toxic effects in large and continuous dosage as was formerly thought. Klinkert (Klin. Woch., Jan. 1, 1927), in 1927, reported a 3d case of *jaundice* of the mechanical type due to continued ingestion of this compound. The total amount used in his case was about 80 Gm. L. J. A. Loewenthal, W. A. Mackay and E. C. Lowe (Brit. Med. Jour., Apr. 7, 1928) state that even if given in the correct intermittent manner, cinchophen or any of its congeners may be dangerous. There may be no premonitory symptoms, although urticaria, albuminuria, gastro-intestinal disturbances and transient

jaundice have been noted. The presence of albuminuria or any evidence of nephritis should be considered as a contraindication to the drug, and the slightest sign of intolerance, such as nausea or loss of appetite, as an indication for immediate discontinuance. A van den Bergh test and estimation of the icteric index of the patient's serum will probably give the earliest evidence of any pathologic effect on the liver cells, and permit of omitting treatment long before any evidence of clinical jaundice can be observed. Acute yellow atrophy ushers in the fatal termination.

### CIRRHOSIS OF THE LIVER.

—**SYMPTOMS.**—C. L. Connor (Can. Med. Assoc. Jour., May, 1927) reports cases showing that there is a decided difference both clinically and pathologically between *toxic cirrhosis* and alcoholic cirrhosis. The former cases have nearly always had a previous attack of jaundice or other disease referable to the liver. Fever may or may not coexist, but there is frequently pain—most often in the liver region—and nausea and vomiting. The attack may be mild and evanescent or severe and progressive. Many patients have recurring attacks of jaundice and some have been operated upon for suspected common duct stone. The condition frequently occurs in the young, even in children. The liver is always small and more distorted than the alcoholic liver, with large irregular nodules. In alcoholic cirrhosis symptoms of portal obstruction and little or no jaundice form the clinical features. The writer describes cases illustrating the development of acute, subacute and chronic yellow atrophy into various stages of cirrhosis. Toxic cirrhosis is caused by the same substances or organisms which cause acute or subacute yellow atrophy. These may be,

in addition to unknown toxins, arsenical preparations or the organisms of infectious jaundice or catarrhal jaundice.

**PATHOLOGY.**—In a pathologic study of *portal cirrhosis* by special methods calculated to reveal the pathogenesis of the disorder, McIndoe (Arch. of Path. and Lab. Med., Jan., 1928) found a progressive dissociation of the portal venous and hepatic arterial circuits of such a nature that the portal blood is diverted to collateral channels at an earlier stage of the disease than the arterial blood. The hepatic cells are thus divorced from their normal portal blood-supply and are ultimately nourished almost entirely by the hepatic artery. Ascites is associated with a lack of balance between the progressive sclerosis of the intrahepatic portal radicles and the development of the collateral pathways, while hepatic insufficiency is more closely related to the subsequent obliteration of the persistent arterial connections. The period between completion of the 2 processes depends on the rate of intrahepatic sclerosis and is of great importance in treatment. Ascites *per se* is amenable to medical and surgical treatment, but when complicated with signs of hepatic insufficiency, as evidenced by retention of dye in the absence of jaundice, it is of much graver import, indicating that the remaining arterial supply of the hepatic cells has been seriously reduced.

The *blood sugar curve* was found peculiar in 5 cases of cirrhosis by Puxeddu (Clin. med. ital., Apr., 1926). After various meals, or upon test ingestion of 100 Gm. of dextrose on an empty stomach, the curve was waver-

ing instead of regular as in health, the rise in blood sugar being preceded by a drop, after which a rapid ascent occurred. The decline was slow, the original level not being reached until after  $3\frac{1}{2}$  hours or more.

In a form of *tropical cirrhosis* discussed by Hughes and Shrivastava (Indian Jour. of Med. Res., Oct., 1927), splenomegaly precedes the cirrhosis, and the disorder occurs in persons subject to repeated malarial infections. Increased fragility of the red corpuscles in hypotonic saline solutions was observed in the early stage of the condition, followed by disappearance of the fragility, or even increased resistance, in advanced cases.

**DIAGNOSIS.**—A large proportion of cases of cirrhosis are not now diagnosed satisfactorily, according to L. G. Rowntree (Jour. Amer. Med. Assoc., Nov. 5, 1927)—partly owing to the mixtures of recognized types of the disease met in practice. He advocates the following clinical classification: (I) Portal or ascitic cirrhosis, comprising (a) cases with ascites and small liver (Laënnec); (b) with ascites and large liver; (c) with ascites and jaundice; (d) large liver without ascites, as portal cirrhosis in pre-ascitic stage. (II) Biliary or icteric cirrhosis (a) without extrahepatic obstruction; (b) with extrahepatic obstruction; (c) with ascites (end stage). Hanot's cirrhosis has not met with general acceptance as a disease entity; it must be exceedingly rare.

*Functional liver tests* yield information of great practical value in cirrhosis, especially the portal type. The following tests are of value: (1) Those for serum bilirubin (van den Bergh) or bile index; (2) for dye retention (phenoltetrachlorphthalein

or bromsulphalein); (3) for bile acids in blood; (4) for coagulation time of blood; (5) for fragility of erythrocytes; (6) for bile or biliary products in urine, stools or duodenal contents. In the absence of jaundice, retention of dye may constitute the only functional evidence of hepatic insufficiency. The amount retained is largely independent of the degree of ascites and the extent of collateral circulation. Latent jaundice is often revealed by the slightly increased level of serum bilirubin; dissociated jaundice may be so revealed at times. In biliary cirrhosis, the serum bilirubin is of the greatest importance: In obstructive and intrahepatic types of jaundice, the serum bilirubin is high, nearly always with dye retention. In certain cases, particularly the intrahepatic type, however, the dye retention is frequently out of proportion to the serum bilirubin. This disproportion may be of diagnostic value in distinguishing intrahepatic from obstructive jaundice. As for the indications for surgical measures, the crucial question is whether or not extrahepatic obstruction exists, and this is best revealed by the presence or absence of bile in the duodenal contents or the stools.

Stress is laid by Rowntree on the great restriction of the portal channels and the extent of the collateral circulation in advanced portal cirrhosis. Only a small proportion of the portal blood actually passes through the liver. This must be taken into account in considering the results of dye retention tests. Since the collateral channels predominate, the dye probably does not reach the hepatic cells as promptly or abundantly as normally. Hence it is removed more slowly.



This may explain the discrepancy between the evidence of dye retention by the direct method now employed in cirrhosis and its excretion in large or occasionally normal amounts in stools collected over a period of 48 hours. Collateral channels are more often encountered in the lumbar region than is usually recognized, and may be more readily demonstrable by having the patient stand, lean forward, and strain as at stool.

A *friction sign* occurring in hepatic cirrhosis is described by Arsenio (Rif. med., Apr. 25, 1927). In a case observed, friction sounds were heard between the 8th and 11th ribs in the right midaxillary line.

**TREATMENT.**—Certain substances, such as **water**, **dextrose** and **calcium**, appear, according to Rown-tree (*loc. cit.*), to possess a specific virtue from the standpoint of the liver. Mechanically, relief of biliary obstruction by **surgical measures** is all-important. **Transduodenal drainage** may prove of help in some instances, but seems of most value in post-arsphenamin jaundice. Ascites may be dissipated through the use of **merbaphen**, **ammonium salts**, and the **restriction of salt and water**. Anemia is best met by prevention of hemorrhage, by **transfusions**, and possibly by **feeding liver**. Pruritus is sometimes relieved by courses of **calomel** and of **emetine**. In other instances, **diathermy** and **sweating** may prove of value. In the writer's experience calomel has proven most effective, in doses of  $\frac{1}{4}$  to  $\frac{1}{2}$  grain (0.016 to 0.03 Gm.) up to 2 grains (0.13 Gm.) a day for periods of 3 or 4 days. **Diet** and **sedatives** may help to control gastrointestinal disturbances. In hepatic insufficiency, **dex-**

**trose** solution in large quantities is of value. In such cases malaise, nausea, vomiting and coma are frequent. Failure of both urinary and biliary excretion may occur and the blood urea increase. These manifestations may disappear, temporarily at least, under the use of **water** and adequate amounts of **dextrose** and **salt**. In ascites the best results are obtained, as a rule, through combined use of **merbaphen** with **ammonium salts** and the **low ionic diet**. Jacobs and Keith favor **ammonium nitrate**, in doses of  $1\frac{1}{2}$  to  $2\frac{1}{2}$  drams (6 to 10 Gm.) daily, because it causes less gastrointestinal irritation.

G. Lyon (Bull. méd., Oct. 29, 1927) notes that in alcoholic cirrhosis, in the early stages, an exclusive **milk diet**, preferably preceded by 3 days on a plain mineral water, with vegetable broth containing but little salt, and hot, sweetened infusions, is most effective. Where the milk is poorly borne—usually because of its fat content—commercially skimmed (hence sterilized) milk may be used, or better, **kephyr** No. 2, or a combination of kephyr and milk. The patient should **rest in bed** for a few days. After 2 weeks a **lactovegetarian diet** may be allowed, and continued until the liver is found to be diminishing in size, digestive troubles disappearing, diuresis returning to normal, and the general condition improving. When the patient's condition seems stabilized, a **mixed diet** is to be given. **Sodium phosphate** seems to stimulate the liver, and may be given thus:

R. *Sodii benzoatis* ... gr. iv (0.25 Gm.);  
*Sodii phosphatis* .. gr. viij (0.5 Gm.).

Pone in cachet. No. i. Da tal. No. xl.

Sig.: Two cachets daily, morning and evening.

Alternate use of **Vichy** and **Vittel waters**, each for 10 days at a time, should be advised; the water should be taken hot and in the morning before rising. The various **alkalies** may be combined with **potassium iodide**, thus:

*R. Sodii bicarbonatis* . gr. xlv (3 Gm.);  
*Sodii phosphatis* .. 3j (4 Gm.);  
*Sodii sulphatis* ... gr. xlv (3 Gm.);  
*Sodii benzoatis*,  
*Potassii iodidi* ..ãã gr. xxx (2 Gm.);  
*Aquæ destillatæ* .. Oij (1000 c.c.).

S. Sig.: Three ounces 3 times daily, warmed on the water-bath, taken before breakfast, at noon, and at 7 P.M.

Hepatic organotherapy, in the form of **powdered liver**, 7½ grains (0.5 Gm.) 2 or 3 times a day, may be tried.

In the stage of ascites, an exclusive **milk diet** and **rest in bed** are indicated. If milk is badly borne, it has sometimes to be replaced by **kephyr** in small amounts, vegetable broth with little salt, Evian water with 2 ounces (60 Gm.) of **lactose** per quart (liter), grapes, etc. **Tapping** is indicated where the ascites reaches several quarts (liters). Among diuretics, **theobromine**, 23 grains (1.5 Gm.) a day, has been preferred. **Calomel**, in daily amounts of 2½ grains (0.15 Gm.), divided into 3 doses, for a few doses, has often brought on marked diuresis and disappearance of ascites and edema. Daily intravenous injections of ⅙ grain (0.01 Gm.) of **mercury cyanide** give equally good results. Less apt to induce toxic effects are the newer organic mercurials, **novasurol** and **salyrgan**. Of these the latter seems much the better because of lesser toxicity. Intravenous or intramuscular injections of this product are given in doses of 16 to 32 minims (1 to 2 c.c.) of the

solution, at 3-day intervals. Almost devoid of toxicity is the new French mercurial product "440 B" or **neptal** Poulenc. The proper dose is 16 minims (1 c.c.) or a little more, injected intramuscularly at intervals of not less than 6 to 10 days. Copious diuresis is said sometimes to follow a few intramuscular injections of **glycogen**, 1½ grains (0.1 Gm.) in 32 minims (2 c.c.) of solution. Saline or vegetable **cathartics** complement the action of the diuretics. **Tapping** enhances diuretic effects.

In *syphilitic cirrhosis*, intravenous injections of **mercury cyanide** are serviceable; **potassium iodide**, 30 to 60 grains (2 to 4 Gm.), should be simultaneously given by mouth or rectum. In *tuberculous cirrhosis* the treatment is the same as in alcoholic cirrhosis.

According to Fiessinger (Ann. de méd., Apr., 1926), the intrahepatic hypertension causing ascites in alcoholic cirrhosis is due to degenerative swelling of the liver cells, compressing the blood capillaries. The efficacy of **mercury** and **bismuth** in certain cases may be ascribed to their slightly toxic action, enhancing the activity of the cells, promoting cell division and creating a new liver parenchyma. A diet containing adequate amounts of carbohydrates, fats and proteins, and **rest** are essential therapeutic measures. In 14 cases referred to, enough of the liver seemed to have recuperated under this treatment to result in a cure.

Among 25 cases of cirrhosis treated by **Talma's operation** in Küttner's clinic, Tempsky (Beitr. z. klin. Chir., cxxxvi, 92, 1926) reports excellent results in 7 instances, comprising 5 cases of hypertrophic cirrhosis, 1 of

atrophic cirrhosis, and 1 of ascites from cardiac cirrhosis.

In a case of *Hanot's cirrhosis* described by Beresow (Arch. f. klin. Chir., July 12, 1927), **splenectomy** was followed by almost complete disappearance of jaundice and marked improvement in many other respects. The liver became 2 fingerbreadths smaller. In this observer's opinion, hypertrophic cirrhosis of the Hanot type is the only form in which splenectomy is suitable. Indications for the operation are hemolytic icterus of long standing, beginning anemia, tendency to epistaxis and bleeding from the gums with increased coagulation time, and subjective symptoms.

**CLIMATIC BUBO.—DIAGNOSIS.**—An intracutaneous test for this disorder has been found satisfactory by Fischer (Arch. f. Schiffs- u. Tropen-Hyg., Feb., 1928). The material injected consists of pus aspirated from one of the lymph-nodes and mixed with 5 to 8 parts of normal salt solution. Where the test is positive, a small nodule appears locally in 24 to 48 hours; it is red, tender, and remains for 10 to 14 days.

**TREATMENT.**—According to H. M. Hanschell (Brit. Jour. of Ven. Dis., July, 1927), the best treatment for climatic bubo is by **protein shock** with killed typhoid-group bacilli given intravenously in doses of 100, 200 and 300 million organisms at 4-day intervals. The glands should never be incised. G. C. Low and W. E. Cooke (Jour. of State Med., Aug., 1926) endorse Hanschell's method of treatment and give **T. A. B. vaccine** intravenously at 4- to 8-day intervals, beginning with 50 or 100 millions and ascending to 250 or 300 millions. The intervals and doses are regulated by the patient's condition, the reac-

tion, and the progress attained. If pyrexia is already present the 1st dose should be small. Where pus is present in the glands, **aspiration** is now performed instead of incision. Several aspirations may be necessary.

**COCAINE.—POISONING.**—Having found intravenous injection of a solution of 1½ grains (0.1 Gm.) of **soluble barbitol** per kilo. of body weight dissolved in 80 minims (5 c.c.) of a saturated solution of **paraldehyde** in water per kilo. of body weight to cause immediate cessation of the convulsions in acute cocaine poisoning in animals, A. L. Tatum (Ill. Med. Jour., June, 1926) suggests application of the same treatment in acute poisoning in man. A dosage equal to or slightly larger than the usual standard hypnotic dose should be tried. If this proved insufficient completely to check the clonic convulsions a cautious increase in dosage would be indicated. The longer convulsions are allowed to continue before administration of the hypnotics, the greater the danger of failure of the treatment.

For the prevention of cocaine intoxication in *local anesthesia*, J. Leshure (Jour. Amer. Med. Assoc., Jan. 15, 1927) has had complete success by giving routinely 6 to 12 grains (0.4 to 0.8 Gm.) of **soluble barbitol** in 3-grain (0.2-Gm.) capsules at least ½ hour before the induction of local anesthesia. Aside from its prophylactic efficacy, the drug induces a mental quietude equal to that induced by morphine, while having none of the disadvantages of the latter drug.

M. R. Guttman (Arch. of Otolaryng., Oct., 1926) refers to the use of **phenobarbital** in the clinic of J. C. Beck and H. L. Pollack for the prevention of serious reactions from cocaine local anesthesia. Oral administration of 3 grains (0.2 Gm.) of this drug was substituted for pre-operative injections of morphine and atropine. The surgeons were impressed by the lack of cocaine reactions and by having more manageable, though slightly drowsy, patients. In 3 cases described, cocaine had produced disagreeable symptoms which phenobarbital relieved completely in a few minutes. If ever confronted by a

severe cocaine intoxication or collapse the surgeons would not hesitate to use phenobarbital intravenously (a fresh solution of phenobarbital-sodium would be indicated for this purpose).

**CODLIVER OIL.**—The value of irradiation of codliver oil by the ultra-violet rays to increase its antirachitic potency has been disproved by E. T. Wyman *et al.* (Amer. Jour. Dis. of Childr., Nov., 1927). Irradiation for 30 minutes of an oil potent in vitamins did not enhance its antirachitic potency, and irradiation for 2 hours noticeably decreased such potency.

According to Peacock (Lancet, Aug. 14, 1926), exposure of codliver oil to any source of white light of sufficient intensity results in the following changes: (1) The normal bright golden fluorescence of the oil progressively disappears, this effect being termed "delumination." (2) Before full delumination occurs, the oil fails to give the arsenic chloride test for vitamin A. (3) Full "deluminated" oil, when kept for some months in the dark, slowly regains much of its fluorescence, but the vitamin A appears to be permanently destroyed. (4) There is a change in the adsorption spectrum corresponding with change in the fluorescence of the oil. As delumination proceeds, the transmission spectrum extends into the ultra-violet region.

B. Kramer *et al.* (Jour. of Biol. Chem., Feb., 1927) have described the preparation of a *cholesterol-free concentrate* of codliver oil which is as potent as the oil itself in amounts equivalent to the original oil. When injected subcutaneously in an ether solution, the concentrate cured experimental rickets in rats; when in a palmitin solution, however, it was inactive.

There is no parallelism between the contents of codliver oil in vitamin A (antiphthalmic) and vitamin D (antirachitic), according to J. L. L. Clare and K. M. Soames (Lancet, Jan. 21, 1928). Some specimens which were rich in vitamin A were poor in vitamin D, and *vice versa*. This lack of parallelism may be explained in part by the fact that vitamin A is less stable than vitamin D and therefore more likely to be impaired by methods of preparation and storage which involve heat and oxidation. The biologic method of testing

codliver oil laid down in the U. S. Pharmacopœia, which aims at the assay of vitamin A only, is open to criticism. The medicinal worth of codliver oil depends more upon its antirachitic value than upon its content of vitamin A, for the latter is readily and more conveniently obtained from foodstuffs.

**THERAPEUTICS.**—Studying in infants the effects of the antirachitic vitamin extracted from oil by Zucker's method, M. Flamini (Pediatria, June 15, 1926) found that it improves the absorption and fixation of calcium, reduces **intestinal putrefaction** and **constipation**, improves the absorption of fat, modifies **eczema**, cures **rickets** and **spasmophilia**, and improves vagotonic manifestations such as **urticaria**.

Concerning the administration of codliver oil to children for the prevention of **rickets**, H. J. Gerstenberger (Jour. Amer. Med. Assoc., Jan. 22, 1927) states that the oil should be given once daily on an empty stomach and when most of the family members are at home, *i.e.*, before breakfast. If the 1st dose is vomited, a 2d should be at once given. The "mess" is much less annoying than it is when the oil is vomited just after a meal. The parent should get the child to understand that the oil is essential to his welfare and that he will get accustomed to its taste within a week or 10 days. Parents may often be advised to take codliver oil, without making any remarks or faces, at the breakfast table as an example to their children and for their own benefit.

According to J. Garland (Amer. Jour. Dis. of Childr., Dec., 1926), the value of codliver oil in **rickets** is rather one of control of the disease than of its prevention. In a study of the *cutaneous administration* of the oil in infants with inorganic blood phosphorus below normal, with or without clinical signs of rickets, he applied gauze pads saturated with 1 tablespoonful of oil to the abdomens of the infants. The pads, held in place with flannel binders, were renewed daily. Of 11 infants, all but 1 showed a marked rise in the inorganic phosphorus in 2 to 3 weeks. H. R. M. Landis (Prog. Med., Dec., 1927) notes that an objection to the foregoing procedure is the disagreeable odor of the oil. For some years he has used the oil as fol-



lows: Three parts of it are mixed with 1 of liquid soap (which readily carries the oil into the skin). A dram (4 c.c.) of this mixture can be rubbed into the skin, leaving a dry surface, in 5 to 10 minutes. Nothing will increase the weight more than this in **marasmic** and **badly nourished children**. The writer has also used the oil in this manner in adults with **tuberculosis** who fail to gain weight under the ordinary methods.

**COLCHICUM.**—Arloing and Langeron (C. r. Soc. de biol., Dec. 3, 1926) have found that *colchicine* injection in guinea-pigs 3 days before sensitization with egg albumin will prevent or attenuate anaphylactic shock. If given just before sensitization it had no effect. These results harmonize with clinical observations to the effect that colchicum should not be given close to the time of an acute attack of **gout**. If given at a sufficient interval before an attack, on the other hand, the drug is capable of preventing it, the attack probably representing a protein anaphylactic shock. The utility of colchicum in **urticaria** is accounted for in the same way.

**COLITIS.**—A *string sign of mucous colitis* is described by A. W. Crane (Amer. Jour. of Roentg., Apr., 1927). It depends for its significance on the continuity of mucoid material within the colon. The sign may relate to any portion of the colon, but most often the descending colon, at times the transverse, rarely the sigmoid, and least often the ascending colon.

A method successfully applicable in the treatment of mucous colitis, according to E. Jacobson (Arch. of Int. Med., Mar., 1927), consists of what he terms **progressive relaxation**, based on the findings that mental and emotional activity may induce esophageal spasm, that such spasm promotes mucous colitis, and that relaxation is attended with improvement of the colitis. The method, the details of which had already been de-

scribed elsewhere (Jour. of Nerv. and Ment. Dis., Dec., 1924), involves procedures calculated to teach the patient to relax the muscles thoroughly by daily practice. During advanced relaxation actual diminution of the knee-reflex can be described.

Five cases of mucous colitis due to *food allergy* are reported by E. Hollander (Amer. Jour. Med. Sci., Oct., 1927). Ordinary treatment for the colitis failed, and the condition disappeared only after omission of foods to which the patients were sensitized, reappearing when these foods were again ingested. Dermal tests were performed by the scratch method, 75 of the more common foods being used. When the complaints are continuous, uncommon articles of food need not be tested. In Case I the tests were positive to milk, egg yolk, meat, chicken and fish; upon exclusion of these foods the disappearance of symptoms was striking. Case II was sensitive to pike, shad, cod, lobster and oyster, and reactions were also obtained to onion, tomato, veal, duck, raspberry, banana, lemon and cocoa; upon restriction of these foods, health was restored in 2 weeks, and sigmoidoscopy after 6 weeks showed the mucosa restored to normal. Case III was positive only to potato and garlic; Case IV, to egg, cheese, herring, orange, prune, radish, celery and rhubarb, and Case V, to tomatoes, eggs, goose, pike and salmon.

A *lymphatic colitis* is described by P. Sittler (Arch. de méd. des enf., Aug., 1927), who finds this 1 of the commonest manifestations of status lymphaticus in the child. **Reduction of fats** brings about rapid improvement. White meats, vegetable purées and cooked fruits may be substituted

for the excess of milk, butter and egg yolk, and milk should be given only in weak dilution. Starchy foods, prepared without fats, should be gradually added. **Tannic acid, calcium and adrenalin** are useful remedies. After a time the normal diet may be resumed.

Rosenheim (Deut. med. Woch., Oct. 15, 1926) describes as *colitis gravis* cases with abdominal pain, diarrhea with bloody, purulent admixtures, and fever persisting for months, with anemia and loss of strength. A wide variety of bacterial and constitutional factors may be causative: Colon bacilli, streptococci, dietetic errors, a constitutional predisposition, remote conditions causing the circulation of noxa in the blood, etc. Stool examination will differentiate dysenteric, amebic, tuberculous and other conditions. The X-rays will reveal stenoses and the extent of the disease. Blood examinations and careful study of the nervous status, especially of the vegetative nervous system, are of prognostic value. The condition is not hopeless even in the most severe cases. The patient should **rest in bed** for weeks or months on a bland, mixed but predominantly vegetable diet, digestible in the upper intestine. **Hydrochloric acid, pepsin and pancreatin** may be indicated. A milk diet is of assistance in occasional instances. **Tannic acid** preparations, **bismuth subgallate**, and **opiates** are useful. Irrigations with 0.5 per cent. **tannic acid** solution, about 8 ounces (250 c.c.), should be given only after the bowels have been evacuated, and on alternate days. **Enemas of starch and acacia**, sometimes with the addition of bismuth subgallate, are, however, more frequently useful. **Pro-**

**tein therapy** should be tried. Measures should be taken to improve the blood, the nervous system, and general strength.

W. A. Fansler (Med. Jour. and Rec., Oct. 5, 1927) accepts the organism found by Barga and Buie, of the Mayo Clinic, as the causative germ in the majority of cases of *chronic ulcerative colitis*. It is a diplococcus resembling a pneumococcus but considered to belong to the streptococcus group. Barga and Buie have reported good results from **vaccine** or **vaccine filtrate** made from the Barga organism. **Intramuscular injections** of **casein** are markedly beneficial in some cases. In cases with frequent bowel movements a **low-residue diet** is in order until the disease subsides. Any diet given should contain ample amounts of **calcium** and **vitamines A, B, C and D**. What foods are given is immaterial, as long as they are non-irritating. Orange juice, tomato juice, cream and **calcium lactate** should be given. Calcium checks bleeding and hastens healing. For marked diarrhea, **opiates**, or **tannigen**, 5 grains (0.3 Gm.) every 2 or 3 hours, or **bismuth subcarbonate**, 1 teaspoonful every 2 hours, are useful. As the disease subsides, 3 or 4 ounces (90 to 120 Gm.) of **kaolin** or of **barium sulphate** will cause the bowel to appear cleaner and the ulcers more healthy. For protection of the ulcers, **bismuth subcarbonate** in liquid petrolatum is desirable. **Gentian violet, mercurochrome** or **acriflavine** by mouth in enteric-coated pills are at least occasionally of benefit. In a few cases **tincture of iodine** by the mouth gives remarkable results. **Stovarsol** has done wonders in certain cases, and 1

obstinate non-amebic case cleared up at once after 2 intravenous injections of **neodiarsenol**. Local treatment is unwise while the disease is acute. To unhealed and resistant ulcers **local applications** are very important, *e.g.*, of **silver nitrate**, **argyrol**, **zinc sulphate**, **potassium permanganate**, **formalin**, etc. The solution used should be warm. It is often well to alternate the type of irrigation. In the last declining stages, **potassium permanganate** solution is valuable. For ulcers visible through the proctoscope, 5 to 40 per cent. **silver nitrate** solution is best. Irrigations should be continued at least 3 months after all ulcerations have disappeared. **Infected teeth** or **tonsils** should be removed.

According to A. Bassler (*ibid.*, Feb. 16, 1927), hemolytic and non-hemolytic streptococci are the important infecting organisms in the majority of cases of severe ulcerative colitis. The best medication by mouth consists of large doses of **bismuth subgallate**, with an occasional small dose of an **opiate** for diarrhea and pain. **Silvol**,  $7\frac{1}{2}$  grains (0.5 Gm.) 3 times a day, does more good than any form of silver solution in an enema or colon irrigation. In cases with remissions due to infection present in the lymphatic structures outside the bowel wall and the pericolic glands, no remedy will block this infection as efficiently as **mercurochrome intravenously**. **Operation** is not to be recommended until constitutional symptoms become distinctive. A **cecostomy** with sufficiently large opening is useful. The irrigating solutions used should be either of the hypertonic or laxative types, plus the use of dyes, or normal

salt solution. Instead of cecostomy the writer often carries out an **ileosigmoidostomy**, or employs it where cecostomy and irrigations have failed. About 59 patients have done well on cecostomy, and of 22 who have survived an ileosigmoidostomy all but 1 have done well. On the other hand, in 22 additional cecostomies the latter operation has not been curative; of these 22, 12 became well after an ileosigmoidostomy, while 3 died from this operation, which has a higher mortality rate than simple cecostomy. In no disease are **blood transfusions** more helpful; often they mean the difference between success and failure in the medical management or in ileosigmoidostomy. Transfusions with simple or immune donors, to control anemia and raise vitality, as an alternate procedure to intravenous mercurochrome injection, to block infection, constitute a good combination in the medical treatment or after cecostomy with irrigations.

**Emetine hydrochloride** proved effective in ulcerative colitis in the hands of Schur (Wien. klin. Woch., Feb. 10, 1927). Three injections of  $\frac{1}{3}$  grain (0.02 Gm.) each were given daily. In addition, **rest in bed** was insisted upon and daily **enemas** given.

In an epidemic of *acute colitis* in children discussed by C. Torres Umaña (Repert. de med. y cir., Bogota, May, 1926), *B. aërogenes capsulatus* (*Welchii*) was often found both in the stools and the milk consumed. In the treatment of such cases, animal proteins should be rigidly excluded from the diet; the children are to be fed almost entirely on vegetable broths to which 6 or 7 per cent. of **lactose** or **saccharose** has been added. Where the Welch bacil-

lus occurred in the stools and the kidneys were healthy, calomel acted better than any other drug. In a number of cases dysentery bacilli were found. Sometimes **antidysentery serum** was effective when used in bowel lavage alone, injection of the serum thus being unnecessary. In a few cases of dysenteriform colitis with streptococci and colon bacilli an **autogenous vaccine** proved of value.

**COLLICULITIS.**—Occupying the floor of the prostatic urethra is a highly sensitive, erectile structure known as the *colliculus seminalis*, or *verumontanum*, regarded as the seat of sexual sensibility in this vicinity and as playing an important part in the mechanism of ejaculation. The most frequent cause of a lesion of the colliculus is gonorrhea; very often the collicular disorder is combined with disease in other parts of the posterior urethra, prostate, or seminal vesicles and epididymes. Congestion of the verumontanum may also be caused by sexual excess, masturbation, withdrawal, or mechanical artifices to prolong the sexual act or prevent pregnancy.

**SYMPTOMS.**—Aside from disorders of the urinary and sexual functions, colliculitis may lead to pronounced neurotic symptoms. Thus, there is a tendency to melancholia, broodiness, apathy and depression. Burning pain in the urethra may be complained of, with a feeling as of a hot wire being pushed down the urethra after urination. Among other more or less common complaints are heaviness in the perineum, vague pains about the genitals, lower abdomen and thighs, "shooting" pains in the testicles, frequency of

micturition, dribbling of urine, terminal hematuria, spermatorrhea, nocturnal emissions, bloody semen, painful or premature ejaculations, poor erections, and prostatorrhea. Priapism or loss of sexual desire may alone have been observed. The urine is loaded with phosphates and a trace of albumin is occasionally found.

**DIAGNOSIS.**—Posterior urethroscopy is required for exact study of the diseased verumontanum. In chronic disease the colliculus, normally of split-pea size and less brightly colored than the surrounding mucosa, becomes the seat of either soft or hard infiltration. In the former condition the structure is seen to be swollen, dull red, cyanotic, lusterless and wrinkled. Less commonly it is bright red, pitted and appears like an over-ripe raspberry. Small polypoid excrescences may be demonstrable, and the organ bleeds very easily. The urethra as a whole is generally found very sensitive to instrumentation. In the later stage, that of hard infiltration, the colliculus appears dry, dirty-gray, leathery and often desquamating, threads occurring in the urine. Finally, the organ becomes flattened out and pale. While gonorrhea typically produces the more advanced pathologic states, repeated congestion from other causes may induce catarrhal changes with hyperemia and small-celled infiltration.

**TREATMENT.**—In the absence of evidence of old gonorrhea, and where the colliculus is found merely hyperemic, much benefit follows the passing of a large, **cold metal bougie** into the bladder, removing it after a few minutes, and then **irrigating the posterior urethra with 1:10,000 silver**



**nitrate** solution. Soft infiltration of the colliculus is treated by gentle **dilatation with bougies**, followed by weekly direct painting of the colliculus with **tincture of iodine** or, if this fails, 5 per cent. **silver nitrate** solution. In hard infiltration, the treatment consists of **dilatations**, the largest metal bougie being followed by **Kollmann's posterior dilator**, and an **irrigation** of weak silver nitrate solution into the bladder. The **galvanocautery**, carefully used, is available for the destruction of papillomas or polypoid excrescences. If neurotic symptoms continue in spite of the treatment, application of the **galvanic current** to the colliculus by means of an appropriate electrode frequently proves beneficial.

**CONJUNCTIVITIS.**—K. Lindner, of Vienna, has pointed out, as noted by W. C. Finnoff (Colo. Med., Dec., 1926), that in chronic conjunctivitis bacteria are seldom to be found in the pus or desquamated epithelial cells. Early in acute conjunctivitis, furthermore, bacteria are present in the epithelium in great profusion several days before they appear in the secretion; these are usually confined to the epithelium and are rarely found in the submucosa. Bacteria infecting the conjunctiva and cornea, according to Lindner, are epithelial parasites, and it is to the epithelium, therefore, that attention must be directed in diagnosis and treatment. Smears are readily obtainable upon thorough anesthetizing of the mucous membrane by 2 instillations of 4 or 5 per cent. cocaine solution at 5 minutes' interval and 1 instillation of 10 per cent. cocaine. A layer of epithelial cells is removed with a platinum

spatula or scalpel sterilized in the flame, without going deeply enough to draw blood. To study bacteria in the cells the wet method of fixation is employed, with staining by Giemsa's or Lindner's contrast stain.

**GONORRHEAL.**—Among 92 cases referred to by E. C. Ebert (U. S. Nav. Med. Bull., Jan., 1928), 41 were subjected to a combined treatment by subcutaneous and intramuscular **milk injections** (6 c.c.) and by local use of 5 per cent **argyrol** and 1 per cent. **mercurochrome**. Local treatment alone, consisting of **boric acid irrigation** every 2 hours, followed by instillation of **argyrol**, was applied in 26 cases. The milk injections apparently had no therapeutic value, exhibiting no advantage over local treatment alone when combined with the latter.

**GRANULAR.**—Evidence materially strengthening the view of a parasitic origin of trachoma was obtained by Noguchi (Jour. Amer. Med. Assoc., Sept. 3, 1927), who was able to produce in monkeys ocular lesions closely resembling the human disease both clinically and histopathologically. He inoculated primates with cultures of an organism isolated from human cases among the American Indians. The bacillus is superficially like the diphtheroids, although differing from them in many ways. Transmissibility of the disease was clearly established and Koch's postulates fulfilled. Direct inoculation of monkeys with human material failed. Seemingly, massive invasion by the bacteria is required to infect.

**TREATMENT.**—As a satisfactory substitute for carbon dioxide snow where it is unavailable, L. Collin (Monde méd., Apr. 1, 1927) recommends freezing by **ethyl chloride**.

The upper eyelid is held completely everted with a suitable lid elevator, the diseased surface washed and dried, adhesive plaster with a hole in it used as a protector, the cornea being also protected by a plaque covered with gauze, and the whole palpebral conjunctiva quickly sprayed with ethyl chloride until freezing occurs. The spraying may be repeated 2 or 3 times at each sitting at intervals of a few minutes, according to the intensity of the lesions. No anesthesia is required. Ethyl chloride tubes with the narrowest outlets are best, giving a more localized spray. One treatment suffices in recent and mild cases. Cases with coarse granulations seem more quickly benefited than those with fine granulations. In long-standing, refractory cases, as many as 4 or 5 sittings are required. As a result of the treatment, the granulations are emptied of their contents and gradually become transformed into cicatricial tissue. Of 26 cases, mostly in school children, 20 were cured, 3 greatly improved, 2 improved, and 1 only slightly improved. Of 32 other cases in older patients, comprising mostly long-standing and complicated trachomas, 10 were cured, 12 greatly improved, 5 improved, and 5 slightly improved.

**Surgical diathermy** is advocated by D. C. Kalloch (Jour. Amer. Med. Assoc., Oct. 29, 1927) for those cases of trachoma in which grattage can only be palliative. Diathermy proved more successful than lid massage or tarsectomy. The operation is confined to a rather intensive desiccation of a triangular area about  $\frac{1}{4}$  inch long from the inner corner of the upper lid outward on the retrotarsal

conjunctiva, with special attention to small inflamed ridges originating in the semilunar fold. It is followed the same day by grattage over the remainder of the lid. In carrying out diathermy—under anesthesia with powdered **cocaine hydrochloride**—the point electrode is made to touch lightly and repeatedly the follicles until they are blanched to their depth. After-treatment consists of instillation of 2 per cent. **mercurochrome** solution followed by **liquid petrolatum**, 1 drop in each eye, continued thrice daily for a week or 10 days.

**TULARENSIS.**—The 2d case of conjunctivitis tularensis observed in the State of Georgia has been reported by S. W. Jackson (Jour. Amer. Med. Assoc., July 10, 1926). A youth of 18, having killed and cleaned several rabbits, soon developed an acute purulent conjunctivitis of the left eye. Ordinary treatment failed. Smears and cultures were negative. Blood examination gave a positive agglutination for *B. tularensis*. There were no constitutional manifestations, such as had been present in all of the other 14 similar eye cases previously reported. The treatment finally seeming effective consisted of the instillation of 1 per cent. **mercurochrome** solution into the eye several times daily. The infection gradually subsided.

**CONSTIPATION.**—An excessive density of the mucous protective film in the intestine, with resulting inadequate irritation of the intestine by the fecal mass, is deemed an important factor in constipation by Maher (Med. Jour. and Rec., Apr. 4, 1928). Anything causing a sudden secretion of thin, watery mucus may

so diminish protection that the irritant fecal mass can provoke the urge to defecate. To effect this purpose there is a natural means. After breakfast, making **pressure on the walls of the rectum** through the post-anal space may be all that is needed to induce defecation, particularly if the voluntary abdominal force is simultaneously in effect, pressing the bowel against the pelvic floor. The postanal pressure should be intermittent and rolling from the coccyx toward the anus.

**Anal massage** with a special instrument devised by the writer was used successfully in 5 cases by M. H. Burnier (*Rev. méd. de la Suisse rom.*, Oct. 25, 1927). This method is advantageous in that it restores normal peristalsis without loss of effectiveness on continuous use and without any toxic effects.

In severe atonic constipation, in which the sigmoidoscope passed in easily and far up on account of the impaired tone and smoothness of the bowel, Aldor (*Med. Klin.*, May 28, 1926) had good results from subcutaneous injections of **pituitary extract**, repeated once or twice weekly.

In a case of laryngeal tuberculosis reported by E. Obermer (*Brit. Med. Jour.*, Jan. 2, 1926), the patient had received  $2\frac{1}{2}$  grains (0.15 Gm.) of morphine daily for the relief of severe pain, with the result that the bowel wall became practically paralyzed, and various purgatives, with strychnine, failed to overcome the condition or relieve the distention and abdominal pain. After an injection of 16 minims (1 c.c.) of **pituitary extract**, however, the patient had a thorough and copious evacuation within 10 minutes. The injection was thereafter repeated every afternoon for several months, regularly with a rapid effect.

The frequency of hypothyroidism as a factor in constipation is stressed by Oswald (*Schweiz. med. Woch.*, Apr. 17, 1926). **Thyroid** acts well in such cases. Spastic constipation is attributable to hyperthyroidism.

While condemning drugs except as the last measure to be considered in the treatment of constipation, Sanders (*New Orl. Med. and Surg. Jour.*, Jan., 1927) endorses their use where correction of faulty habits and removal of the cause has not restored the function to normal. The drugs to be used are, chiefly, **liquid petrolatum** combined with **agar**, and, in obstinate cases, the temporary addition of **cascara** or **magnesia**. In atonic stasis the writer prescribes a simple **fruit mixture** consisting of: Cooked prunes (seeded), 1 pound; dried figs, 1 pound; dates (seeded), 1 pound; agar agar, 2 ounces; senna leaves, 2 ounces. This mixture is run through a meat chopper several times until thoroughly pulverized, and then made into a cake, which is in turn cut into blocks 1 inch square. The dose is 1 block at bedtime.

A **high-fat diet** for constipation is endorsed by F. H. Smith (*Jour. Amer. Med. Assoc.*, Feb. 26, 1927) on the basis of trials in a large series of cases. The diet successfully used consisted of: 5 per cent. vegetables, raw, 50 Gm.; cooked, 50 Gm.; 10 per cent. fruits, raw or cooked, 100 Gm.; juice of orange, 50 Gm.; baked potato, 200 Gm.; 2 eggs; white bread, 60 Gm.; broiled bacon, 20 Gm.; lean meat, 50 Gm.; 20 per cent. cream, 460 Gm.; milk, 400 Gm.; butter, 50 Gm.; mayonnaise (85 per cent. fat), 45 Gm.; cereal (bland), 20 Gm.; sugar, 15 Gm.; coffee, 200 c.c., and water,

1000 c.c. This diet contains about 164 Gm. of carbohydrate, 66 Gm. of protein and 224 Gm. of fat, totalling 3026 calories. Usually 3 to 5 days are required to establish normal bowel habits. The high fuel value makes the regimen particularly suitable for undernourished patients. The food must be served palatably and attractively. The milk and cream may be served in cream soups, cocoa, malted milk, egg nogs and ice cream. Fat served very hot or very cold will be accepted in amounts up to 250 Gm. daily. In planning high-fat diets, the vitamine and mineral content of the food selected must not be overlooked.

Discussing **physical therapy** in constipation of *mechanical origin*, J. Gutman (Phys. Ther., Feb., 1927) advocated, after careful X-ray diagnosis, copious **colonic irrigations**, either saline, alkaline or antiseptic, as required. Whenever the return flow is very foul, the stools alkaline, or ulceration and infection present, **rivanol**, 1 tablet per liter, is added to the ordinary irrigations for retention in the colon; usually 4 to 8 such injections suffice. After thorough cleansing of the bowel, the abdomen is subjected to **actinic rays**, 1000 watts, at 26 to 30 inches for 10 to 20 minutes, according to skin tolerance. **Massage** follows, in a manner calculated to overcome the abnormalities present, by lifting of lowered segments, straightening of kinks and bends, removing angulations, etc. If *adhesions* coexist, the massage is preceded by **diathermy** at the site of adhesions, with tinfoil electrodes, 2 x 4 and 4 x 6 or 3 x 4 and 6 x 8 inches for 15 to 20 minutes, with 800 to 1000 ma. The massage is performed in a direction intended to separate adhering organs. In

*atony* and *dilatation*, the **galvanic sinusoidal** and **slow surging current** is also used, treatments being given for 5 to 10 or 20 minutes with the indifferent electrode on the back and the active over the dilated colon segment, *e.g.*, the cecum. In *rectal atony*, *dilatation* or *spasm*, a rectal electrode is used with the appropriate current. Treatments are usually given on alternate days and the results checked periodically by radiographic, chemical, bacteriologic and other examinations.

#### CORNEA.—EPITHELIOMA.—

An apparent cure of epithelioma of the cornea under **radium** in a man of 50 years is reported by L. Weekers and J. Colmant (Liège méd., July 18, 1926). Two radium tubes, held in place with a paraffin and wax cast fitting tightly to the eye, were used. Under such exposure for 6 days, night and day, to a total of 4320 mc., the growth subsided. A month later, 7200 mc. more were administered in 6 days. The eye was enabled to count fingers at 2½ meters' distance. A radiodermatitis of the lids, brow and cheek developed, which subsided under infra-red rays. No recurrence of the tumor was observed in the succeeding 8 months.

#### CORONARY THROMBOSIS.

—Out of 100 cases observed by J. Parkinson and D. E. Bedford (Lancet, Jan. 7, 1928), 31 died, 68 were alive at the time of writing, and 1 was not traced. Twelve died within 1 month after the attack, but the average survival among the 31 who died was 6 months. Among the 68 still alive the average survival has been 13 months. On pathologic as well as clinical grounds, it can be



confidently asserted that a patient seen alive with coronary thrombosis is more likely to survive than to succumb to the attack. All grades of infarction occur, according to the caliber of the occluded vessel, the largest proving rapidly fatal, the smallest passing unrecognized during life. Urgent symptoms may arise from a small infarction, but this can heal and thus allow of improvement. Eight of the patients are leading an active life doing their ordinary work, 33 are able to get about in comfort though their life is restricted, and 25 are completely invalid from pain or failure. Once the infarct has healed, the functional capacity of the subject will depend on the rest of the myocardium. Where there is a history of previous severe angina or dyspnea, recovery will be less complete than where previous cardiac symptoms have been slight or absent.

**CORYZA.** See ACUTE RHINITIS.

**CRETINISM.**—In a case reported by Bogoras (Zent. f. Chir., Dec. 11, 1926), **transplantation of thyroid tissue** from a woman aged 28 with exophthalmic goiter into a girl of 14 with myxedematous cretinism was performed. The isthmus and right half of the gland were transplanted, and the superior thyroid artery of the transplant was joined by end-to-side suture with the common carotid artery of the cretin. Improvement began in 2 weeks, and after 6 months the patient, previously entirely apathetic and fed like a baby, had become cleanly and coquettish, talkative, and

able to learn to read and explain pictures. She grew 12 cm. ( $4\frac{1}{2}$  inches) in the 6 months, the skin improved, and the pulse rate rose from 65 to 90 or 100.

**CYSTITIS.**—In *acute bacterial cystitis*, N. Blaustein (Jour. of Urol., Apr., 1926) deems **changes of urinary reaction** of vital therapeutic importance. The reaction should be changed as soon as the diagnosis is established, then changed again. In *alkaline cystitis* **calcium chloride** and **ammonium chloride** are the best acidifiers. In *acid cystitis* **sodium bicarbonate** is the best alkalizer, and it possesses also slight diuretic and antiseptic properties. The organism responsible should be identified and recovered for the preparation of a **vaccine**; such vaccine acts best in the acid types, excluding tuberculosis. In the presence of acute symptoms instrumentation and instillations are to be avoided. In the *post-infectious irritable bladder*, **diathermy** is of service. The best bladder antiseptic is **methamine**, given intravenously to avoid gastric irritation. Forced diuresis should be avoided during the antiseptic period. Frequency of urination can be reduced by moderate **elevation of the pelvis**. Chilling of the body should be guarded against, and purging avoided, as it causes congestion and aggravates tenesmus. In the writer's cases of acute exacerbation in chronic cystitis, **autogenous vaccine** was employed at 3-day intervals with distinct advantage; **stock vaccine** was less helpful.

## D

**DEAFNESS.—SYMPTOMS AND DIAGNOSIS.**—In 1000 school children Fowler (Arch. of Otolaryng., July, 1927) found the percentage of deafness to be 7.3. He advocates regular yearly examinations of the ears.

Cases of complete unilateral deafness will sometimes show a residuum of hearing in the deaf ear when tested with the Western Electric 1A *audiometer*, using the double head set, according to Shambaugh and Holderman (Ann. of Otol., Rhinol. and Laryng., Mar., 1928). This is attributed to the transmission of the sound by bone conduction to the opposite, hearing ear. The audiometer cannot, therefore, be used to determine absolute deafness, though of some value for studying the physiology of hearing.

According to Bunch (*ibid.*, 37, 372, 1928), certain cases which show a complete loss of hearing for the tones with the audiometer can be shown by the use of the Struycken *monochord* to have a normal upper limit either by air conduction or by bone conduction. Other cases will show practically the same upper limit determination with both instruments. In lesions in which there is a destruction of the receptors for these high tones, neither type of tone will be heard. The monochord is a valuable adjunct to audiometry because of the fact that the high tones of the monochord are produced with much greater intensity.

**ETIOLOGY.**—Chronic progressive deafness, according to Kopetzky (Arch. of Otolaryng., May, 1927), is

a local manifestation of a general metabolic disorder. The calcium of the blood in such cases is of value in establishing a diagnosis.

Barlow (Laryngosc., Sept., 1927) found experimentally that the function of hearing is apparently not impaired by a diet deficient in vitamins.

**TREATMENT.**—When deafness is due to obstruction of the Eustachian tube, Nesfield (Lancet, Dec. 24, 1927) creates a **new passage** leading from the exterior into the cavity of the middle ear behind the ear drum. This incidentally opens the Eustachian tube. The middle ear being no longer a closed cavity, the patient can easily blow air through the Eustachian tube through the middle ear and out by the external auditory meatus. The middle ear is also drained, and the mucous membrane rendered healthy. The writer operated on over 200 patients, ranging from 4 to 70 years of age. The results depended on the period of the deafness. The improvement in hearing of many patients who had been deaf for 30 years was remarkable, while aggravation of the deafness never followed the operation. In many the deafness was arrested; marked improvement occurred in the great majority.

In a review of the evolution of the **acoustic method**, Goldstein (Ann. of Otol., Rhinol. and Laryng., Mar., 1928) states that the fundamental principle of **vibratory stimulation** is now generally recognized as of practical and definite value. At least 70 per cent. of children with biological congenital deafness retain some rem-

nant of hearing and this remnant has been made the basis of this special training. The conversational human voice was found to be of special value in dealing with these cases. Every pupil should receive daily systematic training irrespective of his degree of deafness, age, or scholastic status. He uses a harmonium for passive education and the human voice for active education. Since the introduction of the radio the use of the harmonium has been practically abandoned. The awakening of the first sound perception is usually sluggish. Comparative musical sounds awaken a mental differentiation as well as a physiological selective differentiation in the organ of Corti. Infinite pains must be taken.

#### DEHYDRATION FEVER.—

According to Aron (Berl. klin. Woch., May 7, 1926), many supposed cases of pneumonia in infants are mere manifestations of hyperthermia due to thirst, the rapid breathing being but a symptom of the lack of water. The dry wrinkled skin, depressed fontanels, dry red tongue, hoarse voice, and vomiting are the other usual symptoms. An erroneous diagnosis may entail the death of the child, while the administration of **water** or **salt solution** by the mouth or rectum saves it. Pyuria and albuminuria are also observed in some cases.

**DEMENTIA PRECOX.—SYMPTOMS.**—A study of the influence of *menstruation* on psychoses in 102 insane women, including 85 with dementia precox, led Repond (Encéphale, Dec., 1925) to conclude, contrary to certain authors, that no

exacerbation of the insanity occurred during the menses. While the influence of menstruation would be felt in the emotional sphere actually, the activity of this domain is reduced in dementia precox.

**PATHOGENESIS.**—In 20 cases of dementia precox, Marotta (Rif. med., Aug. 2, 1926) found evidence showing that disorders of the *endocrin organs* play an etiologic rôle in this disease. There was definite evidence of endocrin deficiency affecting the testicular, thyroid and suprarenal activities, more rare and less marked in the case of the suprarenals. Biologic tests of the endocrin functions supported these findings. The endocrin changes are deemed especially important in that they predispose to various infections which may eventually result in the induction of dementia precox. Evidence of hyperthyroidism was found present in 19 out of the 20 cases, sometimes alternating with hypothyroidism.

In a comprehensive study of 40 cases of dementia precox, Langfeldt (Ugeskr. f. Læger, Sept. 23, 1926) found that in catatonia there occurs a labile behavior with a tendency toward a more and more pronounced *vagotonia*, while in hebephrenia there is *sympatheticotonia*. On the basis of all these investigations, the author postulates that catatonia occurs in consequence of a status thymicolymphaticus and a developmental check in the brain, while hebephrenia is due to similar conditions, yet with a different symptomatology, for which a special type of constitution is responsible.

**PATHOLOGY.**—In a study of 318 autopsies of psychotic patients by Reed (State Hosp. Quart., xi, 377,

1926), the 124 instances of dementia precox showed that there was no physical cause for the observed alteration in the size of the *heart*, the weight being the same as in cases of disorders other than dementia precox. The author agrees with Lewis to the effect that the dementia precox heart does not lack the power of undergoing hypertrophy.

A study of the gas relationships of the *blood* in young males suffering from dementia precox by L. Segal, with clinical observations by L. E. Hinsie (Amer. Jour. Med. Sci., May, 1926), led the authors to the following conclusions: While the oxygen capacity was normal, the oxygen content was below normal and the blood showed a consequent arterial unsaturation. The oxygen consumption having been found high, the existing cyanosis appeared to be the result of: (a) Incomplete oxidation of the blood in the lungs; (b) increased reduction of oxyhemoglobin to reduced hemoglobin in the peripheral capillaries. The mean capillary unsaturation was found to approach the low limit for cyanosis. This condition has also been found in pneumonia and influenza where there is an incomplete oxidation of blood in the lungs. The red blood cell count showed a slight, but uniform increase in the corpuscles of venous over arterial blood. After being subjected to exercise the patients showed surprisingly little increase in heart-rate.

**TREATMENT.**—A study of the blood sugar curves in 10 cases of dementia precox by Smith and Hill (Jour. of Mental Sci., Apr., 1927) showed them to be low; the administration of **thyroid** and **pituitary extracts** raised the curve.

Reiter (Ugeskr. f. Læger, Feb. 17, 1927) tried Walbum's **manganese** treatment alone or combined with other forms of treatment in 50 cases of dementia precox. He also tried in 75 similar cases **cadmium** and **cesium**. Treatment by these metal salts seemed to influence the patients favorably, independently of the size of the dose. If after 10 injections the patient showed psychic improvement or increase in weight, the treatment was continued with the same dose, if not, the dose was adjusted to the needs of the case. From 20 to 40 injections were given, and later the salt tried was given by the mouth. If the metal alone failed, it was combined with **organotherapy**, **vaccine therapy** or **starvation**.

**DENGUE.—SYMPTOMS.**—In 6 cases of this disease, Richardson (So. Med. Jour., Jan., 1927) observed *keratitis* during the first week of convalescence. In 4 of the cases the corneal lesions assumed a characteristic arborescent conformation of the dendritic form. The remaining 2 cases were of the vesicular type, the lesions never coalescing. Iritis or hypopyon did not complicate any of the cases. Partial anesthesia of the cornea was observed in 3 of the patients, while in the other 3 there was unimpaired corneal sensation. In all instances, the corneal lesions were unilateral. The ocular discomfort occurring during the acute stage of the disease in each of the patients was marked. Smears and cultures failed to reveal any bacterial influence. In 3 of the patients relief occurred within 2 weeks without impairment of vision, but 1 case persisted over 3 months, vesicles form-



ing in successive crops. The vision of this case was ultimately reduced from 20/30 to 20/70 because of a central opacity.

**DERMATITIS.—GENERAL PATHOGENIC FACTORS.**—Pathologic processes in the skin do not, according to O'Donovan (Brit. Jour. of Derm. and Syph., Feb., 1927) differ from those that prevail elsewhere. Thus, prolonged inflammation of internal organs leads to fibrosis; long-continued inflammation may be due to syphilis, tuberculosis, to the presence of a foreign body, etc. If the great infecting agents are absent, the one factor absent from the viscera is that of external irritation, such as that due to rubbing and scratching by the patient, even during sleep.

Following an analysis of over 900 feces, Schwartz (Arch. of Derm. and Syph., May, 1926) concluded that *intestinal toxemia* is an important etiologic factor in the production of many dermatoses, especially those of the inflammatory type.

Cederberg (Arch. f. Derm. u. Syph., July 1, 1926) observed a case in which an *ascaris toxicosis* caused a dermatosis clinically closely resembling Hebra's prurigo. The blood count showed a large increase of eosinophiles during the toxemia and a post-toxic lymphocytosis when the toxic symptoms had disappeared. Both helminths and autointoxication can probably produce other dermatoses.

**CLIMATIC DERMATITIS.**—According to Escomel (Gac. Med. de Caracas, May 15, 1926), climatic dermatitis is common in Peru in persons who, having lived in the moun-

tainous regions, move to lower and drier levels. It affects those with a delicate skin in the form of a papular vesicular erythema, which is not contagious, and may yield to the usual treatment for urticaria. It develops within 1 or 2 days or by the fourth day, and the itching is intense. It subsides promptly on return to a higher altitude, but otherwise may heal spontaneously or again undergo recurrences. The local name for it is *chapetonada*, the term originating with the Spaniards who were called "chapetones" during the Conquest of Peru. **Autohemotherapy** has proved a valuable aid in rebellious cases.

**DRUG DERMATITIS.**—In a case of migraine mitigated by daily administration of 0.1 Gm. (1½ grains) of *phenobarbital* observed by Westphalen (Deut. med. Woch., July 1, 1927), the drug had to be discontinued because of a toxic itching dermatosis. The patient, however, had no recurrence of his attacks of migraine.

**FOX-FORDYCE DERMATOSIS.**—Nardelli (Giorn. ital. di dermat. e sif., p. 1458, 1926) describes a case of Fox-Fordyce dermatosis—the 3d, he states, in Italy. He regards it as a neurodermatitis localized to the ducts and mouths of the sweat-glands, presumably dependent on some secretory anomaly of these glands in relation to an endocrin-sympathetic disturbance of utero-ovarian origin.

**FUSOSPIRILLARY DERMATITIS.**—Two cases of fusospirillary dermatitis were observed by Greenbaum (Arch. of Derm. and Syph., June, 1927), 1 of the external auditory canal and the other of the hands and vulva.

**ICEBAG DERMATITIS.**—In a case observed by Thorndike (New Eng. Jour. of Med., Aug. 9, 1928) the cause of the congelation was the icebag. The patient had a chronic interstitial nephritis. Following her last delivery, she was threatened, on both extremities, with a phlegmasia alba dolens. To relieve the pain, icebags were applied to the most tender areas situated on the posterior aspect of the thighs, just above the popliteal space. Previous to admission, icebags had been in use constantly for a period of 3 weeks. In the present instance the icebags were covered with a flannel, and salt was not used with the ice. There had been no sign of edema or local infection. On each thigh over the area where the icebags had been applied there was a lesion in the form of a large, sharply circumscribed, solitary bulla, arising abruptly from the normal skin and about the size of a large grapefruit. Each lesion covered a surface about the area of the palm of a hand. The blisters were filled with a serous exudate, which had not changed its character up to the time of rupture.

There was no sign of an areola about the bullae, but instead, a well-defined line, about  $\frac{1}{4}$  inch wide, of alabaster whiteness. The surface beneath was found necrotic. The ulceration rapidly increased until all the dermal tissues sloughed away to the depth of the subcutaneous structures, leaving ulcers with indurated, sharply cut and not undermined edges, separated from the healthy integument by the white line mentioned. This girdle was the line of demarcation between the frozen and the healthy skin. The process of repair was so slow that a Thiersch skin graft was

resorted to, followed by an uneventful recovery.

**LIGHT DERMATITIS AND PIGMENTATION.**—Dermatitis and pigmentation from therapeutic irradiation can be prevented, according to Rothman (Strahlenther., xxii, 729, 1926), by previous intracutaneous injection of **procaine**. It seems to have a faculty of selective absorption of ultra-violet rays. The wheal induced by intracutaneous injection of a 1 per cent. solution of procaine showed a normal area in the midst of the light dermatitis and pigmentation caused by a strong erythema dose of mercury lamp rays.

**OCCUPATIONAL DERMATITIS.**—The question of invalidity due to occupational diseases of the skin is so great and so important, according to O'Donovan (Jour. State Med., Jan., 1927), that it deserves the investigation of nothing less than a special commission.

**Dyed Fur Eczemoid Dermatitis.**—Thibierge and Lacassagne (Presse méd., Aug. 11, 1926) observed 6 cases of this disorder, due to the wearing of dyed furs. It occurred sometimes as mere red patches accompanied or not by a slight edema of the skin. In most instances the rash became covered with small vesicles which finally produced crusts or desquamation, the scratching from the itching also inducing lichen-like lesions. The skin disorder did not persist long, but it reappeared as soon as the fur responsible for it was worn again. It became chronic if the fur was worn every day. The characteristic feature of the dermatitis is its location. It develops on all the parts in contact with the fur collar. In women wearing low-necked dresses the eruption

occupies also the upper part of the exposed thorax. It may appear on the forehead with fur caps, or on the hands with fur cuffs. The mordants and diamines of the dyes cause the irritation. The lesions may be cured with **lime liniment**, **cold cream**, plain or with **zinc oxide**, also with **zinc** or **sulphonated bitumen ointments**. The itching may subside under lotions of **dilute acetic acid** with or without alcoholic peppermint.

**Flax Dermatitis.**—In a series of cases of laborers working in flax fields, D'Agotino (Semana méd., Sept. 8, 1927) observed a dermatitis on the hands and feet. The cause was found to be a wild chamomile mixed with the flax plants, and not the flax itself, as generally believed.

**Phytogenous Dermatitis.**—Touton (Derm. Zeitschr., Feb., 1927) states that various phytogenous and pseudo-phytogenous occupational dermatoses are in reality due to some contamination. The "mal de canne de Provence," for instance, is due to fungi, the spores of which are found under the bark of reeds; the dermatitis in foresters and timberworkers is due to the cocoons and débris of hairy caterpillars found in the crevices of the bark of various timber-trees. The moniliosis of the hands of fruit-canners in the United States is another example. Mites from fruit or grain are common causes of dermatitis. Dermatitis apparently due to alkaloids or vegetable drugs may, in fact, be due to solvents such as toluol, xylol, or spirit.

Sharlitt and Highman (Trans. Amer. Med. Assoc., May, 1927) recommend the use of **tetraiodomethenamine** in **flexible collodion** in the treatment of dermatophytosis, *i.e.*,

fungus infection of the skin, particularly of the interdigital spaces. The free iodine action of this agent is released from the collodion, which then acquires fungicidal strength. Chemical tests indicated the superior activity of this compound over simple iodine.

**Rubber-tire Dust Dermatitis.**—Cleveland (Can. Med. Assoc. Jour., June, 1927) describes a typical case of this disorder due to poisoning by *hexanitrodiphenylamine*. The latter substance (known colloquially in the factory as "hex") is a powder which is readily conveyed through the air and produces its effects on the face and on the parts covered by dusty sweat-soaked clothing.

**Turpentine Dermatitis.**—Workers in paints, polishes, shellacs, etc., judging from Perutz's experiments (Arch. f. Derm. u. Syph., Dec. 31, 1926), are hypersensitive only to unsaturated terpenes, and not to terpene hydrocarbons. A disturbance in the vagosympathetic equilibrium, in the sense of exaggerated vagal irritability, was noted. Whether this is a predisposing factor or a result of the cutaneous hypersensitiveness is not known. Examinations of the blood and pharmacodynamic studies of the skin confirmed the existence of a preponderance of the parasympathetic over the sympathetic function. Blocking the parasympathetic with **atropine** or augmenting the excitability of the sympathetic with **epinephrine** and **ephedrine** is suggested, in addition to **desensitizing treatment**.

**RHUS TOXICODENDRON OR POISON-IVY DERMATITIS.**—To immunize against this form of dermatitis venenata, Spain and Cooke (Jour. of Immunol., Feb., 1927) em-

ployed successfully, both orally and hypodermically, the active principle of *Toxicodendron radicans*. Injections are preferable, since their use can be kept more fully under control than with the oral method.

**SUGAR DERMATITIS.**—The temporary rise in the blood sugar which occurs in patients who exhibit intolerance to sugar may also produce skin lesions, mainly of the dermatitis type, according to Campbell and Burgess (Brit. Jour. of Derm. and Syph., May, 1927). A **restricted use of carbohydrates** may bring about a cure of the skin lesions when other methods have failed. The writers adduce several cases of rapid cure of purulent skin lesions and senile pruritus as evidence.

In *psoriasis* and *furunculosis* Simon (Arch. f. Verd., xxxvii, 363, 1926) also found a high blood sugar level. Hyperglycemia is common in eczema, especially in chronic cases. **Insulin** treatment acts favorably sometimes, especially on the itching.

#### DEXTROSE.—THERAPEUTICS.

—In 14 consecutive cases in which W. E. Robertson, A. E. Oliensis and D. Stein (Med. Jour. and Rec., Dec. 7, 1927) used a **concentrated solution of dextrose intravenously**, they encountered no unfavorable reaction owing to the observance of the rule that they invariably avoid (1) a rapid rate of injection; (2) a large volume of fluid; (3) distilled water, and (4) improper temperature of the solution employed. Under these conditions even a severely impaired cardiovascular system is no contraindication to its use. They prepare their solution in the following manner: Dextrose, 108 Gm. (3.6 ounces), is mixed with sterile physiologic sodium chloride solution, 180 c.c. (6 ounces), in an Erlenmeyer flask and kept in a hot water bath at the boiling point for 20 minutes. The solution is then cooled to body temperature and immediately injected by gravity through the usual hypodermic needle. The solution must always

be freshly prepared as needed, and if any remains unused it should be discarded. The temperature of the solution can be kept constant simply by placing a hot water bag around the container. The time consumed in injecting the 180 c.c. of dextrose solution must not be less than 30 minutes, and in some cases lengthening the injection to 45 minutes is advisable.

According to Levi (Brit. Med. Jour., Oct., 1927), the *rectum* and *colon* vary in their power of absorbing dextrose in different subjects. The rate of absorption is slow, and very little sugar can, apparently, be introduced into the body by this route. Thus, dextrose given rectally would appear to be of little value as a means of maintaining bodily nutrition. Subjects of post-operative shock are in a state of hyperglycemia and seem to be unable to utilize sugar normally, although their tissues are bathed in a fluid containing an excess of this substance.

**DIABETES INSIPIDUS.**—The more recent studies of this condition have all centered about the pituitary body and the neighboring tissues of the midbrain.

Sajous pointed out in 1924, confirming his earlier labors, that diabetes insipidus and polyuria were caused by any disorder which lowered by pressure or destruction the efficiency of the pituitary body, or of its neural paths from the tuber cinereum, the bulb, the spinal cord, the sympathetic down to the kidneys, thus causing vasodilation in these organs, resulting in an excessive liberation of fluids.

H. Bourquin (Amer. Jour. of Physiol., Jan., 1927) found that cauterization of the floor of the third ventricle (which contains the tuber cinereum) and of the mammillary bodies produced diabetes insipidus. In a case which had resisted all the more modern methods of treatment, including the use of proteins and



pituitary solution, Elmer, Kedzierski and Scheps (Wien. klin. Woch., Apr. 26, 1928) found at the autopsy that a metastatic hypernephroma had formed in the midbrain, causing destruction of the underlying nuclei and centers.

In a carefully studied case of diabetes insipidus, Illievitz (Can. Med. Assoc. Jour., Apr., 1927) failed to find either inosite, creatinin, indican or tryptophan, or anything which itself might be regarded as a causal factor, nor pathologic lesions of the kidney *per se*.

**TREATMENT.**—In 2 cases of diabetes insipidus Rathery and Marie (Paris méd., May 12, 1928) obtained good results by the use of **posterior lobe extract**, this lobe alone proving effective. They injected it subcutaneously, but recommend as preferable the introduction of **pituitary powder** into the nasal cavity in doses of 0.15 Gm. (2½ grains). They lay stress on the fact that no method of treatment other than the above is comparable to it in efficiency.

Although 5 cases observed by Depisch and Höglér (Wien. Arch. f. inn. Med., Jan. 15, 1927) failed to fit into the hyperchloremic or normochloremic types of diabetes insipidus, **pituitary extract** proved efficient in all.

**Insulin** has been found useful in some cases of diabetes insipidus, but Villa (Klin. Woch., May 7, 1927) found it of service only in the hyperchloremic form.

## DIABETES MELLITUS. —SYMPTOMS AND DIAGNOSIS.

—Rabinowitch (Can. Med. Assoc. Jour., May, 1928), recalling that von Noorden in 1904 had called attention to the fact that in some diabetics there occurs a canary-yellow discoloration especially about the nasolabial folds, on the palms of the hands and the soles of the feet, and

that in such patients the blood serum becomes intensely yellow, studied this condition, now known as *diabetic carotinemia*, in 1014 cases of diabetes. A dietetic cause for the carotinemia was eliminated by giving these patients the uniform diet for all diabetics, especially with regard to the vegetable content; also by the fact that 13 of the 59 had shown the staining long before starting the high-vegetable diet. Carotin, being regarded as merely one of several lipochromes present, was made the basis of the test, as it could be easily demonstrated by the method of Hess and Myers, that of quantitatively extracting the alcohol-soluble carotin of the plasma by means of low-boiling point petroleum-ether. Of these carotinemic diabetics, 44 per cent. required insulin, as compared with 18 per cent. in the whole series of diabetics; 61 per cent. suffered from arteriosclerosis, as opposed to a 22 per cent. average generally; 4 cases had gangrene of the extremities; 11 had hyperglycemia hard to control with insulin; 6 showed a raised renal threshold for sugar, and 4 had insulin edema. In short, the occurrence of this condition in the course of a case of diabetes mellitus may be looked upon as an unfavorable prognostic sign.

A. M. Greenwood (Jour. Amer. Med. Assoc., Sept. 3, 1927) urges physicians to warn diabetics that they are more liable than others to *skin disease*, particularly if the skin is dry, and that the feet, so commonly infected by fungus diseases, should be looked after with unremitting attention.

*Changes in refraction* occasionally occur in diabetes. Post (Amer. Jour. of Ophth., Sept., 1926) adds 2 cases to those so far reported in which

glycosuria was followed by an increasing myopia or decreasing hypermetropia, while a sudden reduction of sugar in the urine was followed by a decrease of the myopia or an increase of the hypermetropia. The author quotes the explanation of this process by Duke-Elder, after a study of 45 cases, to the effect that it is due to osmotic processes involving the lens, caused by a variation of the molecular concentration of the blood and tissue fluids with the sugar content, the tendency being to return to normal on the reestablishment of metabolic stability.

In 307 diabetic patients studied by Spalding and Curtis (Boston Med. and Surg. Jour., Aug. 4, 1927), ranging in age from 11 to 73 years, 207 showed no abnormalities of the retina, 46 presented retinal arteriosclerosis with no other changes, 16 exhibited a retinitis, all showing arteriosclerosis, while 32 patients had cataracts. Of the latter, 11 showed arteriosclerosis of the retinal vessels, while in 15 no fundus could be seen. Changes in refraction, indicated clinically by a blurring of vision or by a temporary loss of sight, were found in 22.

Only 2 patients exhibited the punctate form of retinitis. Both of these cases had marked hypertension and renal impairment. Hypertension is a consistent finding in those cases presenting retinal arteriosclerosis and retinitis.

Salus (Med. Klinik, Feb. 17, 1928) described what he regards as an heretofore unknown diabetic change of the iris, the expression of capillary changes, which, on account of the special circulatory relations of the eyeball, results after some time in glaucoma. To this he gives the name *rubeosis iridis diabetica*.

In a study of the physical development of *diabetic children*, Priesel and Wagner (Zeit. f. Kind., June 2, 1926) found it normal, including that of the sexual sphere, whether the children had been treated with diet alone or with addition of insulin. Morrison and Bogan (Amer. Jour. Med. Sci., Sept., 1927), however, found that *bone development* is in advance of the chronologic age in children with diabetes of recent onset, and is below the chronologic age in children with diabetes of long standing. Narrowness of the shaft and thinness of the cortex characterize the diabetic children of long standing. Bone atrophy occurs in a certain number of children who develop diabetes before the 9th year, but has not been found above that age. Transverse striæ of the bones are found in a larger percentage of diabetic children than of normal children.

Referring to the *overgrowth* observed in the diabetic child, Priscilla White (Jour. Amer. Med. Assoc., Jan. 15, 1927), basing her remarks on a study of 100 children who subsequently developed diabetes, states that the diabetic child closely resembles in some respects the thymic child, who is superior in height, mentally precocious, and has a profuse growth of lanugo hair. She refers to a case in which Ralph Major found *post mortem* an unrecognized status lymphaticus.

Diabetic *gangrene* occurred in 36 out of 1016 patients treated in the diabetic clinic of the Montreal General Hospital, according to Rabinowitch (Can. Med. Assoc. Jour., Jan., 1927). In the experience of Blotner and Fitz (Boston Med. and Surg. Jour., June 24, 1926), gangrene has

proved relatively frequent, having occurred in 7 per cent. of all diabetic patients admitted. While it depends, as a rule, on obliterative vascular lesions of the extremities of elderly patients with superimposed infection, thrombosis or osteomyelitis, the underlying cause of the vascular diseases is still unknown. In a series of 69 cases reported, trauma, often of a very minor nature, was the immediate cause of the gangrene in 65 per cent. of these cases.

Ardesbir (Lancet, June 26, 1926) observed *gangrene of the nose* in a diabetic child of 8 years. The slough was removed surgically. The urine became sugar-free after the administration of 20 units of insulin over a period of 3 days. The wound healed promptly.

T. C. Smith (Ky. Med. Jour., Aug., 1927) observed a case of diabetes in a 3 year old colored boy, who recovered from beginning gangrene, and did well living at home, with diet and insulin managed by his mother.

*Leukemia* and *tuberculosis* were observed in each of 32 cases found recorded by Rapaport (Cal. and West. Med., Dec., 1927). The diabetes preceded the myelogenous leukemia. In his own case it did not appear until over 3 months after the patient had been admitted to the hospital. The 2 additional cases of diabetes mellitus with myelogenous leukemia reported in the literature were complicated by miliary tuberculosis.

*Coma* in diabetes, according to Sevringhaus and Raube (Jour. of Metab. Research, June, 1924), is due directly to inability to oxidize glucose, owing to absence or deficiency of insulin. This view helps to explain the retarded mental processes observed in diabetic patients and the muscular weakness.

Snapper (Med. Klinik, June 17, 1927) noted insufficiency of the kidneys in coma in that there occurred retention of nitrogen and inability to oxidize betaoxybutyric and diacetic acids, all of which are rapidly destroyed by the normal kidney. Diabetic coma is also attended with over-production of ketone bodies in the liver, with simultaneous impairment of their oxidation in the degenerated kidneys and muscles. Insulin does not help in such cases. The restriction of proteins is indicated not only because ketone bodies form from them, but also because the kidneys, which are overloaded with the end-products of protein metabolism, cannot oxidize a sufficient amount of ketone bodies.

The *respiratory quotient test*, according to O. H. Petty and W. H. Stoner (Amer. Jour. Med. Sci., June, 1926), is now generally accepted as the deciding factor in the diagnosis of a doubtful case of diabetes. Many different interpretations of this test have been reached, however, so that the same experimental data may confuse and even lead to opposite diagnostic conclusions by different observers. This is attributable to lack of uniformity of technic, *e.g.*, as to the amount and form of dextrose administered, the time at which samples are taken, the nature of the previous diet or fasting, etc. There is, however, practical unanimity in the general idea that 2 factors in the blood-dextrose curve should be considered in making a diagnosis: (1) The maximum height to which the blood sugar rises; (2) the time required for the blood sugar to return to normal. Some observers attribute greater value to one of these factors

than to the other, while a few claim either one or the other to be the only factor of diagnostic import. Briefly, however, respiratory quotient curves, before and every  $\frac{1}{2}$  hour for 3 hours after the administration by mouth of 1.75 Gm. (27 grains) of dextrose per kilo. ( $2\frac{1}{5}$  pounds) of body weight, afford a direct index of the normality or abnormality of the sugar-burning mechanism. They furnish an absolute differentiation between diabetes mellitus and renal glycosuria, while diabetes mellitus may be diagnosed earlier than by the usual glucose tolerance test. A number of patients whose blood sugar rose above 180 mgm. per 100 c.c. and returned to normal in less than 3 hours were shown by respiratory quotient curves to be definitely diabetic.

**ETIOLOGY AND PATHOGENESIS.**—Joslin (Ann. of Clin. Med., June, 1927) adduces evidence to the effect that in diabetes a previous history of obesity, an excess of blood fats and their derivatives in the blood, and a high incidence of gall-stones point to the coincident presence of arteriosclerosis, as interpreted in the Virchow-Aschoff theory concerning the genesis of this arterial disorder. Letulle, Labbé and Heitz (Arch. des mal. du cœur, Sept., 1927) studied the histological changes which the arteries present in diabetes. The roentgenograms indicate impregnation of the middle coat, with permanent dilation of the vessel, while the changes in the intima are rare. The peripheral arteries show a predilection for calcification, especially those of the extremities, the aorta remaining intact. The calcium and cholesterol deposits run parallel to the arterial incrustations.

According to Oretel (Bull. Chicago Med. Soc., Sept. 12, 1925), it is now an open question whether the rôle of the pancreas in diabetes mellitus does not involve the organ as a whole, rather than the islands of Langerhans alone, the pancreas itself regulating metabolic activity, including that of sugar. In this connection, M. G. Wohl (Jour. Amer. Med. Assoc., Sept. 18, 1926) found that *avitaminosis* probably played a rôle in the production of certain symptoms, especially asthenia, in diabetes mellitus. He observed the case of a diabetic who developed a condition similar to beriberi and eye lesions somewhat analogous to those of xerophthalmia, as a result of improper diet. Strauss (Klin. Woch., Feb. 12, 1927) observed during the World War that many diabetic patients died of circulatory failure pointing to exhaustion of the adrenals. **Adrenalin, strychnine, caffeine and digitalis**, the 3 latter being excitants of the adrenals and heart, showed the best effects in cases of circulatory failure.

In keeping with the fact, familiar to endocrinologists, that both insufficiency and overactivity of the endocrin organs may give rise to glycosuria, H. J. John (Ann. of Clin. Med., Oct., 1926) and also Lund and Richardson (Arch. of Surg., Aug., 1925) found the fasting blood sugar above normal in only 6 out of 68 cases of *hyperthyroidism*. John (Amer. Jour. Med. Sci., June, 1928), in a study of the relationship between the thyroid and the pancreas, found that diabetes was not rare in hyperthyroidism. The conclusions are that the presence of hyperglycemia with glycosuria is not rare in hyperthyroidism; that it probably indicates a functional



diabetes, and that a patient who continues to have hyperglycemia and glycosuria should be treated as a diabetic. The degree of hyperglycemia bears no relation, however, to the severity of the hyperthyroidism or to the height of the metabolic rate; it is probably not due to the hyperthyroidism *per se*, but acts rather as a provocative factor, the direct cause being the insulogenic apparatus.

Joslin and Lahey (Amer. Jour. Med. Sci., July, 1928), while regarding hyperthyroidism as the factor in disease of the thyroid which leads to glycosuria, state that 43 cases of primary hyperthyroidism were encountered by them in 4917 cases of true diabetes. Some degree of thyroid enlargement was observed, however, in 208 other cases. As will be shown under TREATMENT, the authors advocate surgical measures.

The pathogenic relationship between *focal infection* and hyperthyroidism with diabetes as end-result assumes special interest in the light of the above data. J. H. Barach (Arch. of Int. Med., May, 1927) found chronic tonsillitis so frequently present in a group of 362 cases of diabetes that he characterizes the experience as "striking," the number of such cases being 114. In the 226 cases of diabetes in which the previous history of the disease was complete, there was a record of recurrent tonsillitis and the presence of diseased tonsils at the time of physical examination in 107 cases—almost  $\frac{1}{2}$  of the total number. These patients had thus carried diseased tonsils into the 4th and 5th decade of life. A focal infection of 30 or 40 years' duration, even if intermittent, is injurious.

D. Cohen and A. E. Cohen (Urol. and Cutan. Rev., Nov., 1926), referring to focal infections in the etiology of diabetes, recall some observers who have obtained little if any benefit after removing such foci. Allen, while noting that decisive proof is necessarily difficult, is doubtful if remote foci play any part in the etiology of the majority of cases of diabetes. Adams, in some recent work at the Mayo Clinic, was unable to elicit any important etiologic connection between diabetes and gall-bladder disease, cholecystectomy having but little influence on the course of diabetes. Joslin, in commenting upon a case in which the removal of the prostate was said to have led to the cure of diabetes, noted that no case of this sort had come under his personal supervision, although his experience with diabetes in association with enlarged prostates had been extensive. Cousins describes a case in which the removal of the appendix had a partially curative influence upon diabetes. The authors, however, report a case which showed marked improvement in carbohydrate tolerance after removal of a chronically infected prostate.

In a series of 100 diabetic patients studied by Stubbs (Va. Med. Mthly., Dec., 1927), a definite clinical connection was established between *disease of the biliary tract* and the diabetes in 38 instances. As stated by Gordon, Connor and Rabinowitch (Amer. Jour. Med. Sci., Jan., 1928), after a careful study of such a case, however, it does not necessarily follow that, in spite of a clear history, diabetes following repeated attacks of gall-bladder disease is due to the latter. The case also emphasizes the

fact that the clinical picture (attitude, expression, color and nutrition) is not a reliable index of progress in diabetes treated with insulin. Blood analyses are here indispensable. This patient appeared to be well nourished and felt well. The post mortem observations, however, showed that the skin did not contain fat, but water. Also, because of the long duration of the disease and the arteriosclerosis, other evidence of active diabetes (glycosuria) was masked. The patient had a raised renal threshold for sugar and afforded another demonstration of the relationship between the cholesterol content of the blood and prognosis.

Castex (Presse méd., Aug. 7, 1926), referring to *renal diabetes* in a paper based on 6 personal cases, held that intestinal toxemia was the dominant etiologic factor in all, 1 of the cases showing intestinal protozoa. The direct causal condition of the diabetes, however, was the acidosis resulting from the toxemia.

An analysis of 1000 cases by John (Arch. of Int. Med., Jan., 1927) showed the incidence of syphilis in the series to be 2.6 per cent. There was an hereditary history of diabetes in 4.6 per cent., and a familial history in 5.1 per cent. The highest blood sugar level on admission was 908 mgm. per 100 c.c. Blood sugar figures as high as 310 mgm. were encountered without glycosuria. The diabetic renal threshold was high in many cases. The general belief that insulin once used must always be continued was shown to be fallacious by cases in which good progress followed the discontinuance of insulin.

**PATHOLOGY.**—Many authorities, including Allen, Macleod, Dia-

more and Weichselbaum, deem the insular apparatus entirely independent of the rest of the pancreas. The islands and the glands are united because both structures develop from the same epithelium. Diabetes, however, is thought to be caused by changes in the islands alone. Other authors believe in the functional relationship of the two. To test the point, Dubnova and Izigson (Klin. Medit., May, 1927) studied pancreatic enzymes in the duodenal juice of 14 diabetics. They came to the following important conclusions: 1. Study of the duodenal enzymes throws considerable light on the condition of the pancreas in diabetics. 2. In grave cases of diabetes, the external pancreatic secretion is decreased. 3. The fermentative activity of the pancreas falls with the lowering of the patient's condition. 4. Parallelism in the fall of the 3 enzymes does not exist. 5. Diastase suffers most commonly, next lipase, and very rarely trypsin. Diastase was found diminished in the blood, urine and excreta. Histologic studies showed pathologic changes in the entire parenchyma as well as in the islands of Langerhans. It is apparent, therefore, that both the pancreas itself and the islands are factors in the morbid process.

A study of the *calcium metabolism* by Kylin (Acta med. Scand., Apr. 30, 1927) gave an average of 12.1 mgm. of calcium (as oxide) per 100 c.c. of blood in diabetic patients, as against 11.1 in healthy subjects. Insulin lowered the blood calcium content and increased the calcium elimination by the urine. The urinary concentration following injection of 1 Gm. of calcium chloride was lower in diabetes than in health.

In 4 diabetic patients in coma, Meyer-Bisch and Wohlenberg (Zeit. f. klin. Med., May 4, 1926) were able to confirm their view that a low concentration of *urinary chlorides* is the first sign of *impending coma*. Inspiration of the blood follows, however, and conceals the lowering of the salt content of the blood. In fully developed coma, insulin alone is not capable of averting dangers rapidly enough. An intravenous injection of 400 to 500 c.c. ( $\frac{1}{2}$  to 1 pint) of a 4.5 per cent. **solution of sodium bicarbonate** acts more rapidly. The patient in coma reacts to an intravenous injection of a hypertonic sodium chloride solution differently from the normal, owing to the pancreatic hypofunction.

**TREATMENT.**—The treatment of diabetes mellitus in *children* has received considerable attention. According to Dennett (N. Y. State Jour. of Med., Jan. 15, 1926), there is no question that the children who are seen and properly treated within 1 or 2 weeks after the onset are those that have the best chance. As soon as possible after instituting the **insulin and dietetic treatment** the aim is to get the urine sugar-free and keep it so. Even a small amount of sugar in the urine a few hours a day is an added burden to the pancreas. Practically all severe cases of diabetes in children are accompanied by acidosis, the main source of acetone bodies in the blood being the fat. Insulin not only brings about the utilization of sugar, but corrects the acidosis, since the proper utilization of starches and sugars is necessary to the complete combustion of fats. In severe acidosis the administration of carbohydrates in conjunction with

insulin not only protects the patient from sugar-shock, but hastens the elimination of acetone bodies in the blood and tissues.

**Insulin** is indicated even in light cases of diabetes in children, according to Thoenes (Monats. f. Kind., May, 1928). The diet, however, should always be controlled, inasmuch as the severity of the condition can be judged by the reaction of the organism to an approximately normal diet. The amounts of sugar and acetone excreted in the urine and the sugar content of the blood during fasting are as significant as the determination of the amount of insulin and the time required to produce a normal metabolism.

In 95 cases of children under 15 years of age, Body (Can. Med. Assoc. Jour., Oct., 1927) found that only 15 per cent. were able to take an adequate diet without **insulin**, and in none of these did the initial tolerance exceed 100 Gm. of carbohydrate daily. Three-fourths of the remaining 85 per cent. could not be kept aglycosuric on their basal diets without insulin. Further, 37 patients had coma, most frequently before the beginning of treatment, but 6 became comatose on several occasions after the institution of treatment because of dietary excesses. As to results, 14 children have already lived from 4 to 4½ years, and 29 have outlived the 2½ years previously allotted to them. In 2 the condition was sufficiently mild to render insulin unnecessary, while insulin alone has made life possible in the remaining 26. Moreover, as a result of a well-balanced diet, proper rest and **exercise**, these children are in better general health than at the beginning of treatment.

Recalling that *infantile* diabetes is comparatively rare, and that until the

advent of insulin such cases presented a grave prognosis, Bowcock and Wood (Jour. Amer. Med. Assoc., Jan. 9, 1926) state that, even when the diabetic baby lived for a time, its development and nutrition were greatly retarded. They report a case in a male infant in whom diabetes was discovered at 16 months. The 18 months' treatment brought out the striking feature in this case of a practically normal increase in height. The baby gained 9 pounds during 18 months and was about 2 pounds underweight at the time of writing. This degree of undernutrition has been maintained intentionally, Joslin having shown that moderate undernutrition is of distinct advantage to the patient.

J. W. Sherrill (Cal. and West. Med., June, 1928) submitted his results and conclusions concerning 62 cases of diabetes in children which had been under treatment over 1 year, but several of which had been treated by **dietetic measures** alone for 5 years before the introduction of **insulin**. He urges constant sugar freedom and regulation of diet to keep the body weight within standard limits, as obese children are difficult to control clinically. Sugar freedom is best maintained when the carbohydrate-fat ratio is kept approximately 1:1. Moderate carbohydrate diet permits normal increase in body-weight and obviates the difficulties of hypoglycemic reactions and glycosuria. The little patients should receive as much as possible of insulin without inducing hypoglycemia, rather than as little insulin as possible to avoid glycosuria.

In 47 cases of diabetes mellitus analyzed by Toverud (Brit. Jour. of Childr. Dis., Oct.-Dec., 1927), the

hereditary factor was present only in 8 cases, or 17 per cent., whereas acute infections immediately preceding the diabetic symptoms were present in 12 cases, or 26 per cent. A diet calculated on the basis of each child's carbohydrate tolerance was used, which provided a protein intake of 3 Gm. per kilo. (2½ pounds) below 7 years of age and 2 Gm. above 7 years of age. The keto-antiketogenic ratio could usually not exceed 1.75:1 without development of acidosis. The author concludes that all children ought to be treated with **insulin**, and in 3 daily doses, as blood-sugar studies after protein intake reveal an increased blood sugar in normal and particularly in diabetic children. A blood sugar of normal value throughout the whole day was obtained in most of these children. In cases in which the disease had lasted for some time or was severe, the blood sugar could be kept normal in the course of the day with 3 daily doses of **insulin** ½ hour before meals. Of the 47 children treated, 17, or 36 per cent., succumbed. Five died in coma closely connected with an infection. One child died in coma just after a fracture of the right femur.

In *adults*, Lawrence (Practitioner, Feb., 1927) holds that a patient whose blood sugar may be kept within normal limits on a diet sufficiently liberal to allow him to be active does not need **insulin**—with the possible exception of some elderly individuals. If blood tests immediately before and 1½ hours after the noon meal show figures approximating 0.12 per cent. and 0.18 per cent., the patient may be considered within normal limits. If urine tests are being made, the specimens should be collected 1 or 2 hours after the evening meal or after the largest carbohydrate meal of the day. If insulin is being used, the most appropriate time to make the test is about 4 hours after the largest dose;



this is the time when the figure is about 0.1 per cent., which may be considered satisfactory. If the figure is above this, more insulin should be given; if below 0.08 per cent., less insulin must be used for the next dose because the patient is approaching the level of hypoglycemia.

Referring to 40 cases of exudative and fibroid *tuberculosis* complicated with diabetes, Rosenberg and Wolf (Deut. med. Woch., June 3, 1927), in keeping with prevailing views, found that the simultaneous presence of the 2 disorders aggravated the prognosis. Yet, **insulin** greatly mitigates the danger involved. With the doses properly standardized, the course is nearly the same as in ordinary cases, although *tuberculosis* lowers the sugar tolerance. But the presence of this disease constitutes an urgent indication for insulin, and because of this such cases should not be referred to ordinary *tuberculosis* sanatoriums but to special institutions in which appropriate dietetic and insulin treatment can be given by experienced physicians. Excessive doses of insulin sometimes exert a favorable influence upon the pulmonary process. The insulin not only removes the glycosuria but lowers the blood-sugar to normal limits. Aggravation of an existing *tuberculosis* in consequence of insulin therapy was never observed, with the exception of a temperature rise in 3 cases, lasting from 2 to 3 days.

Rabinowitch (Can. Med. Assoc. Jour., Dec., 1927), however, warns against the use of excessive doses of **insulin** regardless of the complicating disease present. If all patients who receive insulin and who actually require it were divided into groups of

those who employ it properly and those who do not, it would be found that by far the great majority die not in spite of the use of insulin, but because of the abuse of it.

Barraud (Presse méd., Oct. 30, 1926) observed a case in which diabetic mastoiditis, otitis media, high blood sugar, the age of the patient, and the severe symptoms forbade operation. **Insulin**, however, not only caused disappearance of the morbid symptoms, but cured both the mastoiditis and the otitis media.

*Resistance to the action of insulin* is occasionally encountered. According to Maurice and Aubertin (Presse méd., Dec. 29, 1926), this may be due to many and diverse factors. Thus, an intense emotion may promote resistance to insulin. Disturbances in the functions of the pituitary, thyroid or suprarenals may create conditions favoring resistance. Neutralization of insulin may occur when it is adsorbed by blood colloids. Adsorption reactions explain the resistance to insulin in cirrhosis or insufficiency of the liver; also when the proteolytic ferments of the digestive juice are increased. In many cases diabetes is due not to lesions of the pancreas but to inactivation of its hormone. In this connection Glassberg, Somogyi and Taussig (Arch. of Int. Med., Nov., 1927) deem it warranted to assume the existence of at least 2 varieties of diabetes mellitus, the one due to pancreatic disease and responding to insulin, the other to a deficiency in the production of a muscle enzyme and relatively refractory to insulin.

Studies of the blood of a diabetic patient who was refractory to insulin treatment by Häusler and Högler (Klin. Woch., May 19, 1927) showed

that while the blood plasma from other diabetic patients inhibits the fixation of dextrose to erythrocytes, no such action was present in the blood plasma from the refractory patient. Nor did this patient's corpuscles accept more dextrose after addition of insulin, until they had been repeatedly washed. They conclude that diabetes of this type is not due to an insufficiency of the islands of the pancreas, but rather to the inability of tissue cells to respond to the action of insulin.

In a refractory case in a girl of 12 years, Sztavrovsky and Waltner (Monats. f. Kind., Dec., 1927) found 3.5 to 7 per cent. of sugar in the urine. This was reduced to 1.5 and 4 per cent. by restriction of carbohydrates in the diet (60 Gm. daily), but remained unaffected by the injection of various preparations of insulin, even as much as 300 units daily, in 1, 2, 3 or 4 injections.

This is said to be the first case of its kind on record.

According to M. Labbé (Bull. de l'Acad. de méd., Jan. 4, 1927), cases of diabetic glycosuria refractory to insulin do not exist. Insulin treatment fails in renal diabetes, in which the regulation of glucose is normal. In glycosuria from congestion and cirrhosis of the liver, insulin is without effect. In hyperglycemic diabetes complicated with hepatic cirrhosis its action is only retarded. There may be resistance to insulin in glycosuria associated with changes in the endocrin glands—the thyroid, pituitary or suprarenals. In the case of intercurrent infection, the dose of insulin should be increased in order to overcome the resulting resistance to the treatment. The main causes

of the failure of insulin are insufficient doses and inappropriate diet.

The prevailing impression is that while insulin is highly beneficial when properly used, it does not eventually prove curative. Labbé (*ibid.*, Apr. 5, 1926) believes that there is some indication of the possibility of diabetes being cured. While he doubts that histologic regeneration of the pancreas may occur, evidence is accumulating that functional regeneration can be established. In 3 of his cases the disease appeared to be progressively overcome; the patients improved steadily and were apparently well on the road to complete recovery.

The oral use of pancreas has been studied by various authorities, including Cammidge, Sansum and Murlin, and bids fair to afford aid in this direction.

**DIARRHEA.**—In the various forms of diarrhea presented by a series of 23 patients, including 1 due to poisoning by corrosive sublimate, Luria (Arch. f. Verd., Nov., 1926) used intramuscular injections of Witte's peptone, 5 c.c. (1¼ drams) of a 5 per cent. solution, from 1 to 3 times. One injection sufficed in many instances to arrest the diarrhea. It failed, however, in specific disorders of the intestine, such as tuberculosis. The exclusion of casein is advocated by Moll (Monats. f. Kind., June, 1926), return to the use of milk in gradually increasing amounts being carried out cautiously.

**INFANTILE DIARRHEA.—**  
**DIAGNOSIS.**—In a clinical study of acute alimentary disturbances in 35 infants, A. G. Mitchell (Jour. Ind. State Med. Assoc., Apr., 1926) showed

that where there existed clinical evidence of *dehydration*, the determination of the blood urea nitrogen, uric acid and the carbon dioxide of the blood plasma showed different values, depending on whether or not the infants were suffering from toxic symptoms and hyperpnea. If no toxic symptoms were observed, the blood non-protein nitrogen constituents were practically normal. If moderate toxic symptoms were present, there usually was a moderate increase of non-protein constituents, but if the patient showed distinct evidence of toxic symptoms, the blood urea nitrogen and uric acid usually were decidedly increased over normal, although the increase was neither consistent enough nor great enough to indicate that uremia was a primary cause of the fatal termination. A decrease in the carbon dioxide capacity of the blood plasma was found when the dehydrated infants showed clinical evidence of hyperpnea. In other infants in whom hyperpnea was not noticeable, but who were moderately toxic and whose blood usually contained an increase in non-protein nitrogen constituents, the plasma showed a diminished carbon dioxide capacity in some instances. Usually, however, the carbon dioxide capacity of the plasma was normal when there was no increase in the respiratory rate and depth.

In certain sucklings, according to Pereda y Elordi (Arch. esp. de ped., June, 1926), the infant's lips do not fit closely about the nipple and large amounts of air are swallowed. The air ingested causes colic and green stools accompanied by expulsion of the air. Such green stools react to nitric acid and if the child still gains in weight despite the diarrhea, aërophagia is the underlying cause of

the trouble. True green diarrhea is alkaline, and does not react to nitric acid, but to lactic acid. In aërophagic cases the infant should be fed in a **horizontal position**.

C. Krenz (Amer. Jour. Dis. of Childr., Oct., 1927), in 11 children with diarrhea of unknown etiology whose stools contained pus, blood and mucus, obtained a positive *skin reaction* to the broth culture filtrates of 1 or more strains of *B. coli* which had been isolated from the diarrheal stool. After the stools became normal, the skin reaction became negative to 1 of these strains, but continued to be positive to all others which had previously been positive. The strains that gave negative reactions during the disease remained negative subsequently. The strains of *B. coli* that gave these skin reactions varied culturally. They were of the *communis* type in 6 cases and of the *communior* type in 5. The individual strains of the same type showed slight cultural variations. The serums of these patients failed to agglutinate the bacteria in every instance.

An analysis of 45 cases of *acute* and *chronic dyspepsia* in infants by Toverud (Norsk Mag. f. Laeg., Aug., 1926) showed that quantitative and qualitative underfeeding, especially lack of vitamins, and parenteral infections were responsible for the chronic nutritional disturbance. Even a slight cold or cough may result in the production of a clinical picture imposing as primary dyspepsia.

In 3 of the infants necropsy revealed unsuspected pyelitis or an abscess, while the symptoms had been apparently merely those of dyspepsia. All the infants except 1 improved at once when given Frölich's "**normal milk**," which is rich in vitamins and calories. This is a  $\frac{2}{3}$  milk in water plus 4 per cent. of sugar, a tablespoonful of **cod-liver oil** and 1 tablespoonful of **malt extract**, for the daily ration.

In 12 infants, aged from 3 to 15 months, suffering from infantile diarrhea, Lorente (Clínica y Labor., Zaragoza, May, 1927) found a marked *polynucleosis*. When the large intestine was involved, *mononucleosis* prevailed. In the infant, transitional mononuclears appeared which could be assigned to the lymphocyte group, but were difficult to identify as large mononuclears. In cases of whooping-cough associated with intestinal disturbances, more typical lymphoid cells develop. In gastrointestinal disturbances in infants, the usual eosinophilia disappears.

**ETIOLOGY AND PATHOLOGY.**—In 628 cases of *summer diarrhea* in white infants of the poorer class, Wilkins (Amer. Jour. Dis. of Childr., May, 1927) found that from 7.5 to 13 per cent. developed dysentery, and 27 per cent. simple diarrhea. Among those not exclusively breast-fed the incidence of dysentery was from 10 to 17 per cent. and of diarrhea 33 per cent. Of the cases of gastrointestinal disturbances, from 19 to 33 per cent. were caused by dysentery. Dysentery is of much longer duration than "simple diarrhea," lasting more than 2 weeks in 65 per cent. of the cases. When breast-fed infants were excluded, there was approximately the same frequency of gastrointestinal disturbances during the 1st and 2d summers.

**TREATMENT.**—E. B. Woods (Jour. Mo. State Med. Assoc., Jan., 1928) recommends **citric acid milk** owing to its vitamine content and its stimulating power over the systemic oxidation processes.

Abt (Jour. Mich. State Med. Soc., June, 1926) warns against the use of laxatives in a baby with diarrhea, progressive emaciation, anorexia and vomiting. They increase peristalsis,

the number of stools and the water loss from the body, and thus aid in the production of dehydration. They also irritate the intestinal mucosa, and do no possible good. Proper diet and **hydrotherapy** are indicated, antiseptic drugs being no longer employed. In extreme restlessness or severe diarrhea, small quantities of an **opiate** may be required.

In 74 nurslings who suffered from diarrhea of various degrees of severity, F. Kruse (Med. Klinik, Oct. 21, 1927) obtained good results with **rice porridge** and **milk**. They were given only the porridge first; gradually milk was added to it, and finally, by the 12th day, a mixture of  $\frac{1}{2}$  milk and  $\frac{1}{2}$  porridge was given. **Calcium carbonate**, a pinch, was added to the food from the 2d day on, the 1st day being a fast day, except for **fennel tea**.

Referring to the treatment of *primary diarrhea in breast-fed infants*, Slobosiano and Munteano (Nourrisson, July, 1927) state that the diarrhea may be due to an abnormal amount of lactose in the maternal milk, which is responsible for fermentation and an excessive content of acids in the infant's stools. These acids accelerate intestinal peristalsis. Adsorbing substances neutralize the intestinal acids. They use a mixture consisting of water, 175 c.c. ( $5\frac{2}{3}$  ounces), **aluminum silicate** and **animal charcoal** or **tricalcium phosphate**, 10 Gm. ( $2\frac{1}{2}$  drams) each, **ether** 2.5 c.c. (40 minims), and **syrup**, 20 c.c. (5 drams). Two teaspoonfuls of the mixture are given 4 or 5 times a day. The intestinal colic soon disappears, and in 2 days to 1 week the stools become normal.

**DIGITALIS.—PHYSIOLOGIC ACTION.**—In a study of the action of digitalis on the *parasympathetic nerves* of



the intestine of rabbits Weger (C. r. Soc. de biol., Mar. 25, 1927) found that when digitalis or strophanthin was added to the Tyrode solution in which the intestine was immersed, the amplitude and frequency of the intestinal contractions increased, indicating that digitalis (and strophanthin) enhanced the irritability of the parasympathetic fibers, rather than that of the muscle cells.

An extracardiac action of digitalis was also studied by Leibowitz (Berl. klin. Woch., July 30, 1926), who observed *hyperglycemia, glycosuria and acetonuria* during digitalis treatment in a patient with auricular fibrillation. The patient had later a low blood sugar. Digitalis administered during compensation of the heart disease raised the blood sugar, but did not cause a glycosuria.

**UNTOWARD EFFECTS.**—Sudden death in patients with grave heart disease is frequently due, according to Gallavardin (Presse méd., Dec. 29, 1926), to ventricular fibrillation, preceded by changes in the cardiac rhythm. The rhythmic syndrome is frequently provoked or aggravated by even small doses of digitalis. Coupled rhythm, with tendency to extrasystolic impulses or to short tachycardiac fluttering, is the warning syndrome.

W. B. Porter (Va. Med. Mthly., June, 1926) observed 5 cases in which there was cardiac evidence of digitalis overdosage. The disturbance of rhythm closely simulated that observed in animals poisoned with digitalis. In 2 instances there was an undoubted idioventricular rhythm having the characteristics of an ectopic ventricular tachycardia. In the 3d case there was a transition from normal Q R S complexes into a typical levocardiogram, indicating right bundle-branch block. This appeared in paroxysms and disappeared after the withdrawal of digitalis.

When toxic doses of digitalis have impaired the normal cardiac rhythm—a condition attributed by Haskell (Jour. of Pharm. and Exp. Therap., Jan., 1928) to the action of this drug upon the vagal endings and upon the myocardium itself—this author recommends **quinidine** to restore it.

**THERAPEUTICS.**—*Rectal administration* of digitalis was found effective by

Brucke (Deut. med. Woch., Sept. 16, 1927). Suppositories were well absorbed and rapid in action. In certain **mitral disorders** this proved preferable to oral administration. In **cardiac insufficiency** from other causes (muscle degeneration, etc.), the results were as good as with oral administration, in a few cases better. Proctitis occurred in 14 per cent. of the patients and should be guarded against by a temporary disuse of the suppositories with oral use as temporary expedient.

Takahashi (Tohoku Jour. of Exp. Med., Apr. 19, 1927) found that addition of 0.05 to 0.1 per cent. hydrochloric acid solution to digitalis infusion does not lessen its effectiveness. The practical value of this fact is that the acid preserves the efficiency of the infusion by preventing deterioration.

**DIPHTHERIA.—PROPHYLAXIS.**—Since the introduction of antitoxin the mortality from diphtheria has been decreased 75 per cent., but the ratio of children infected by this disease has shown but slight reduction. Hence the importance of locating the children who are liable to infection and of affording them protection against it. The Schick test is foremost in this connection, making it possible to determine whether a child is or is not liable to infection.

Planteyd-Dorrepaal (Ned. Maand. v. Gen., xiv, 479, 1927) tested 127 diphtheria patients by the Schick reaction at intervals up to 57 days after the administration of antitoxin. During approximately the first 18 days the percentage of positive reactions was about 30. After this it rose, the average for the next 3 days being about 50. This was followed by a decline to the previous figure (about 30). Neither the age of the patient nor the severity of the infection appeared to have an appreciable influence on the acquisition of active im-

munity. The size of the dose, on the contrary, seemed to have a decided influence in this respect, the percentage of positive reactions in the last period being much lower in the patients who had been given large doses, although the rise in the second period (representing the extinction of the passive immunity) was not influenced.

Following this procedure, the value of which is now generally recognized, immunization of the children shown by the Schick test to be vulnerable to infection is being resorted to. It is likewise giving eminently satisfactory results. In a large Glasgow hospital for contagious diseases, the testing of nurses by the Schick method and the active immunization of those found to be susceptible to diphtheria has almost, according to R. Cruickshank (*Lancet*, Jan. 14, 1928), entirely eliminated diphtheria among the nursing staff.

The immunization of children shown by the Schick method to be susceptible to diphtheria may be carried out either passively by the injection of antitoxin or by the anatoxin or immunizing substance discovered at the Paris Pasteur Institute by Ramon, and allied to "toxin-antitoxin." The latter method is now recognized as the better, giving more certain and lasting results.

In a series of 1414 children vaccinated by Lereboullet and his assistants (*Bull. Soc. med. des hôp. de Paris*, Apr. 30, 1926) with anatoxin, a dose of 0.5 c.c. was given at the 1st injection and 1 c.c. at the 2d and 3d, with 3 and 1 weeks' intervals. Two injections induced immunity in 95 per cent.; 3, in 100 per cent. The immunity still persisted up to 8 and 12

months. The children had to interrupt their usual occupations on account of vaccinal reactions in only 3 per cent. of instances. The best age for immunization is between 2 and 3, the receptivity being then maximal, and the reactions least marked.

Systematic vaccination with diphtheria anatoxin was practised in the seaside hospital for tuberculous children in Berck, France, during a severe epidemic of diphtheria. The vaccination consisted of 3 injections, the 1st of 0.5 c.c., the 2 following of 1 c.c. each, all given within a month. First 896 children under the age of 13 were vaccinated; later, 474, including children over 13. While in the previous year 67 cases of diphtheria had occurred, 5 ending fatally, in 1926 there were only 15 cases and not a death.

Roubinovitch, Loiseau and Lafaille (*Bull. Soc. méd. des hôp. de Paris*, May 14, 1926) found that 1 injection of 0.5 c.c. of anatoxin induced immunity in 17 of 23 children with a positive Schick test. The immunity persisted for 19 to 25 months. After 2 injections of 0.5 and 1 c.c. of anatoxin, the immunity still persists in all the 17 children of another group, for 12 to 24 months at the time of writing.

Harvier and Requin (*Paris méd.*, May 8, 1926) vaccinated with diphtheria anatoxin 228 school children with a positive Schick test. Two subcutaneous injections of 0.5 and 1 c.c. were given, 3 weeks apart. Control Schick tests showed immunity in 95.4 per cent. after 2 injections, and in 64 per cent. after 1 injection. Pronounced reactions from the injections were never noted in children under the age of 7. Therefore, regular vac-

cination with diphtheria anatoxin may be carried out in all children between 2 and 7, without a preliminary Schick test.

Although immunization failed to occur when diphtheria antitoxin was administered orally, Ramon and Zoeller (C. r. Soc. de biol., Mar. 25, 1927) found that diphtheria **anatoxin** introduced into the nose of several adults whose serum contained diphtheria antitoxin proved successful. The instillation was repeated twice a day for 6 days. The antitoxin value of the serums had increased markedly 8 days after the last instillation. A positive Schick reaction became negative. Absorption of the anatoxin by the nasopharyngeal mucosa produced a general immunity similar to that from subcutaneous injections. The diphtheria bacillus is frequent in the nasopharyngeal tract. It secretes a toxin which is absorbed by the mucosa; prolonged absorption of the toxin induces an occult specific immunity. The method is termed "**rhino-vaccination**."

**TREATMENT.**—In a comprehensive bacteriologic study, F. Meyer (Deut. med. Woch., Feb. 10, 1928) found that *malignant pharyngeal diphtheria* showed large numbers of hemolytic *streptococci* in 50 per cent. of the cases. The streptococci liberate a toxin which provokes locally changes similar to those produced by diphtheria toxin (necrosis, severe cellular and fibrinous inflammation), as well as marked changes in the heart-muscle and liver and a very severe anemia. This **streptococcic** toxin can form an **antitoxin** which may be tested as to activity and strength in experimental animals. This antitoxin should, according to the author, be injected in

all cases of malignant diphtheria simultaneously with the diphtheria antitoxin, since it is harmless in all cases and insures recovery in the 50 per cent. of cases of streptococcic poisoning. Finkelstein and Koenigsberger (Deut. med. Woch., July 15, 1927) likewise recommend injections of **streptococcic antitoxin** besides diphtheria antitoxin in cases of grave diphtheria.

Peters (Lancet, Dec. 10, 1927) emphasizes the fact, based on an experience of over 17 years, that *acidosis* or *reduced alkali reserve* associated with ketonuria occurs in the more toxic cases of diphtheria, and that the administration of alkalies tends to prevent the *pernicious vomiting* and *circulatory failure* which may occur in the 2d week of the disease. His routine treatment of all cases of diphtheria has included the administration of 30 grains (2 Gm.) of **sodium bicarbonate**, 5 grains (0.3 Gm.) of **potassium bicarbonate**, and 7 grains (0.46 Gm.) of **calcium carbonate** in 4-hour doses, until the morning urine is alkaline to litmus, which takes 3 or 4 days. For younger children, the dose is halved.

**Carriers.**—Harries, MacFarlane and Gilhespy (Lancet, Sept. 24, 1927) performed **tonsillectomy** and **removed adenoids** where needed in 90 diphtheria carriers. Of these 76 became negative at once, though diphtheria had afforded no immunizing effects.

Humphrys, Withers and Ranson (Colo. Med., May, 1926) report 39 cases of diphtheria carriers treated with very well filtered **roentgen rays** generated at an actual voltage of 200,000, corrected to a sea level reading. In no case was there given more than 60 per cent. of an ery-

thema skin dose, which is just sufficient to cause some dryness of the mouth, due to the effect on the parotid, and in some cases a very slight cervical lymphadenitis. Two febrile reactions occurred simulating an acute tonsillitis. Neither lasted more than 1 week. Of the entire series, only 4 cases remained positive 80 to 85 days after the first irradiation.

**DISLOCATIONS.—CERVICAL VERTEBRÆ.**—In a case of grave spastic paralysis following fracture of the 5th vertebra with dislocation, Haugseth (Norsk Mag. f. Læg., Apr., 1926) obtained complete cure by resorting to a **laminectomy**.

**HIP.**—In a study of 5908 reported cases of dislocation of the hip, R. W. Jones (Brit. Jour. of Surg., July, 1926) found that 27 had been *spon-taneous* and therefore non-traumatic—a proportion of 1 in 219 cases.

Perkins (Lancet, Mar. 31, 1928) states that the 3 characteristic features of *congenital* dislocation of the hip are: (1) The female profile; (2) dipping of the shoulder when the child walks, and (3) shortening of the thighs.

Hahn (Münch. med. Woch., Mar. 11, 1927) states that congenital dislocation of the hip-joint is in most instances an acquired deformity in predisposed infants. He favors early treatment in every infant in whom the X-ray examination reveals a high and lateral position of the femur with a widened acetabular angle. In an infant, it is, as a rule, sufficient to leave the **plaster case** on for 2 or 3 months.

In old congenital dislocations of the hip, according to L. C. Abbott (Arch. of Surg., May, 1926), it is difficult to

secure reduction by the usual methods because of the marked pathologic changes that have taken place in the joint. He found **skeletal traction** effective in stretching the contracture of the soft parts and bringing the head of the femur to the level of the acetabulum. Reduction can then be secured by **operation**. In a series of 5 successful reductions, the functional result as regards stability, increased length of the leg, and the improvement in gait was much the best where a bony ankylosis in good position for weight could be obtained.

In dislocation caused by *infantile acute osteo-arthritis* of the hip-joint, Putti and Zanolì (Chir. degli organi di mov., Nov., 1927) hold that non-surgical treatment invariably fails, either totally or partially. **Surgical treatment** after the causative inflammatory process had cleared up gave, in 15 cases reported, excellent immediate results in every instance. In 1 case the reduction was perfect after 8½ years; in 5 cases, after 1½ or more years.

**PATELLA.**—Formiggini (Clin. pediat., Apr., 1926), after correcting the congenital retraction and relaxation of the muscles involved, sutures a stout **flap** to hold the patella in place. This new tendon is split off **from the tibial ligament** and sutured to the anterior surface of the patella and the inner tissues of the knee while still solidly attached to the inner condyle. The functional outcome is excellent.

**SHOULDER.**—Kirschner cured habitual dislocation of the shoulder by **transplantation of a band of fascia** about the joint. König (Zeit. f. Chir., May 8, 1926) used the method in 10 cases, 7 of which were operated



on from 4 to 15 years ago. But 1 of the 10 cases suffered a recurrence. To prevent recurrence due to slipping forward of the humerus, Speed (Surg., Gyn. and Obst., Apr., 1927) drills a hole about 1 inch deep diagonally into the neck of the scapula. Into this he inserts a **bone transplant** removed from the anterior surface of the tibia. The transplant is driven home, about  $\frac{3}{4}$  inch being left projecting anteriorly and obliquely across the lower anterior margin of the shoulder joint. This does not lessen the normal range of shoulder-joint motion, but prevents the humeral head from slipping forward into anterior and habitual dislocation.

**DIVERTICULITIS, INTESTINAL.**—This disorder is far more frequent than is generally believed. In a study of 218 post-mortem and 52 clinical cases, Fifield (Lancet, Feb. 5, 1927) found 11 in which an abscess had developed in the left fossa, 1 in the left groin, 3 in Douglas's pouch, 1 in the right iliac fossa, and 2 in the right lumbar region. General peritonitis occurred in 12 cases, in 3 of which it complicated acute intestinal obstruction. Intestinal obstruction was generally chronic, with occasional subacute attacks. Vesicocolic fistula was present in 4 cases. Tumor was present in 23 cases. Constipation was present in the majority, occasionally alternating with diarrhea.

In the 52 cases reviewed by J. F. Erdmann (Amer. Jour. of Obst. and Gyn., May, 1926) the diverticulitis was located in the colon. In all acute cases **operation** should be done, although subsidence and cure of attacks occasionally takes place as in other infective processes. All chronic cases

may be observed until obstructive symptoms appear. An extensive diverticulitis may, however, be present without giving rise to symptoms. Corkill (Brit. Med. Jour., Jan. 29, 1927) reports a case in which from the cecum to the beginning of the rectum were hundreds of diverticula containing beads of feces and varying in size from that of a pea to that of a cherry. These diverticula had been present for at least 14 years without giving rise to any symptoms.

Spriggs and Marxer (Lancet, May 21, 1927) detected some stage of *diverticulosis* of the large intestine in 10 per cent. of 1000 consecutive patients in whom an X-ray examination of the alimentary canal was made, 2 men being affected to 1 woman. Since half the individuals with small diverticula of the colon do not suffer any inconvenience therefrom, the authors believe that diverticula are probably present in a not inconsiderable proportion of the general population over 50 years of age. In children the condition is rare. In the general cases analyzed, the pelvic colon was affected in 120 instances; the descending colon, in 79; the ascending and transverse colon, in 33, and the whole colon, in 24 cases.

Diverticulitis of the *duodenum* is likewise not infrequent, having been found in 2 out of every 12 specimens of duodenum examined by J. C. B. Grant. MacLean (Ann. of Surg., Jan., 1927) reports 4 personal cases. He removed diverticula attached to the 3d and 4th parts of the duodenum and behind the pancreas by a **transduodenal diverticulectomy**.

**DUODENAL ULCER.—DIAGNOSIS.**—According to Puhl (Deut. Zeit. f. Chir., Dec., 1927), gastric

ulcer and duodenal ulcer represent the same disease, though differently located. He found 49 duodenal and 51 gastric ulcers in 100 gastric resections. Both types of ulcer are less frequent and milder in the female than in the male, and the lesions show a greater tendency to spontaneous healing. The ratio of gastric to duodenal ulcer in the female is 2:1. In roentgenologic studies, the niche demonstrated by Akerlund is often seen, in spite of the fact that duodenal ulcers are usually small. In the absence of the niche, deformity of the duodenal bulb is the most characteristic sign.

Duodenal ulcer has increased in frequency during the past 20 years, according to Wilkie (Lancet, Dec. 10, 1927). It is a common disease in the female, more so than gastric ulcer. In women, however, hunger-pain is often absent, the "catch meals" of the housewife being probably responsible for the clinical indefinite picture.

Definite ballooning of the left lower abdominal quadrant is given by Stetten (Amer. Jour. Med. Sci., Aug., 1927) as an early sign of *perforated* duodenal ulcer. It is produced by the contraction of the right upper, right lower and left upper abdominal quadrants, which have become invaded and rigid, while the left lower quadrant is still uninvolved and relaxed. In 7 cases reported by Cottle and Spalding (Ann. of Surg., Mar., 1927), **operation** was performed within 10 hours of onset and all recovered. A certain roentgen-ray observation is believed by the authors to be of more value when found than the usually unsuccessful search for diminished liver dulness. The sign consists of the presence of gas between the diaphragm and the liver. Irving

Gray (Trans. Amer. Med. Assoc., May, 1927), however, reported a series of cases in which a history suggestive of duodenal ulcer was obtained, but in which, on thorough investigation, no ulcer was found. In each case a careful history had been taken, complete laboratory data even obtained, and thorough physical, fluoroscopic and X-ray examinations made. The X-ray findings were accepted as conclusive proof of the absence of ulcer. Among the causes responsible for the history suggesting duodenal ulcer were: (1) Chronic nicotineism; (2) constitutional factors (neurosis and vagosympathicotonia); (3) chronic gall-bladder disease (with or without stones); (4) chronic appendicitis, and (5) miscellaneous causes—(a) epigastric hernia; (b) endocrin disturbances; (c) excessive use of coffee or tea; (d) excessive use of certain foods, such as sugar or condiments.

For the diagnosis of duodenal ulcer K. Trommer (Münch. med. Woch., June 11, 1926) uses the duodenal tube. When an ulcer is present, the contents are acid; there is a considerable amount of mucus, some leucocytes, and more albumin in the first fluid than in that produced by an infusion of dextrose. Small quantities of blood are usually present. The liver function is normal. When there is a carcinoma of the pylorus, the blood may be hemolyzed and the duodenal contents are alkaline.

**TREATMENT.**—In 10 years' observation, D. VanderHoof (Trans. Amer. Med. Assoc., May, 1927) obtained excellent results in the majority, without recourse to surgery or hospitalization, by employing a modified Sippy treatment over a period of

2 years. The patients report every 6 months and each time roentgenograms are taken by the roentgenologist who made the original study. Persistent and regular treatment are imperative. Clinical and X-ray evidences tend to show that the ulcers are healed and the patients remain free from symptoms after treatment is discontinued. In certain cases, with definite indications, **operations** were performed. Coöperating surgeons believed that, before surgery is resorted to, in most cases the patient should have the benefit of medical treatment.

In 100 cases of duodenal ulcer operated by various methods, Balfour (Ann. of Surg., Nov., 1927) recorded the following results: **Gastroenterostomy** in 3 cases, complete relief; **gastroduodenostomy** in 2 cases, complete relief in 1; **excision** in 4 cases, complete relief in 2 and partial relief in 2; **posterior gastroenterostomy** in 82 cases, complete relief in 78 and incomplete relief in 4. Failure resulted in some cases despite a second operation.

According to A. Tierny (Bull. méd., Aug. 20, 1927), **gastroenterostomy** remains the operation of choice in duodenal *stenosis*, but **gastropylorectomy** is indicated when there is *hyperacidity*. He prefers **resection** in all other cases, while gastroenterostomy is indicated in aged patients and in those with azotemia. If, however, in the latter, the patient does not digest well after the operation, **resection** of the duodeno-pyloric cone should be performed.

#### DYSENTERY.—DIAGNOSIS.

—Manson-Bahr (Proc. Roy. Soc. of Med., xxi, 898, 1928) states that

while laboratory examination of the feces often proves negative, the *sigmoidoscope* furnishes accurate information concerning infection of the *Entamæba histolytica* type. The lesions in the sigmoid and rectum are very clearly defined and extend down to the level of the internal sphincter. In about 20 per cent. of the cases the lesions are confined to the cecum and ascending colon, too high therefore for sigmoidoscopic examination. The ameba can often be isolated from the lesions if the mucosa is scraped with a dull spoon-curette passed through the sigmoidoscope and if the scrapings are suspended in salt solution for microscopic inspection. The scattered, isolated ulcers with normal tissue between them are small and shallow and surrounded by hemorrhagic areas which are in the submucosa. If not ulcerated, the lesions form minute, yellow, papular elevations, which are really collections of pus and nests of amebas and débris communicating with submucous ulcers. Especially in chronic or latent amebic dysentery, in which the organism is difficult to isolate, knowledge of the sigmoidoscopic appearance of the bowel is of tremendous value.

**PATHOGENESIS.**—Lloyd Arnold (Trans. Amer. Med. Assoc., May, 1927), with reference to bacillary infection, lays stress on the immunizing power of the gastric secretion. Acidity of the stomach kills many bacteria ingested by the mouth, the concentration of acid for this bacterial action varying with the composition of food ingested. It is absent under those conditions that inhibit or suppress hydrochloric acid secretion. Bacteria introduced directly into the duodenum are de-

stroyed before they reach the ileum or cecum. Studies of the bactericidal mechanism of the small intestine indicate that the potency of this disinfecting process depends on the presence in the contents of the upper part of the small intestine of acid reacting substances. The only source of acid, other than that ingested, is derived from the gastric mucous membrane. Interference with the normal autosterilizing mechanism of the intestinal tract makes the individual more susceptible to gastrointestinal infectious diseases. Sudden suppression of gastric secretion by toxic or irritating substances also plays a rôle in non-infectious diarrheas and "food-poisonings." All this applies eminently to the pathogenesis of dysentery.

The *dysentery bacilli* are grouped by Castellani (Amer. Jour. of Trop. Med., July, 1927) as (a) dysentery bacilli; (b) paradysentery bacilli, and (c) metadysentery bacilli. The 3 groups have a very important characteristic in common: They do not produce gas in any sugar. A somewhat similar nomenclature may be used to indicate the various types of bacterial dysentery: (a) Bacterial dysentery *sensu stricto*, due to *B. dysenteriae* Shiga-Kruse; (b) paradysentery, due to the different varieties of *B. paradysenteriae* Collins (var. Flexneri, var. Hissi-Russelli, etc.); (c) metadysentery, due to the metadysentery bacilli (bacilli of genus *Lankoides* and *Dysenteroides*).

The types of dysentery bacilli found in children were studied by Yoshitomi (Oriental Jour. Dis. of Infants, Apr., 1927) in 57 cases. The Y type was isolated from 26 cases, the Flexner type from 19 and the

Shiga type from 5 cases. The Shiga bacillus cases were of the longest duration, 33 days, and also gave the highest mortality, 23 per cent. In the remaining cases, the mortality was only 8 per cent.

It should be borne in mind that, particularly in the tropics, various bacteria may cause dysenteric diarrhea. Thus, Gomes and Pessôa (Annaes Paulistas de med. e cirurg., Nov. and Dec., 1926) describe a case in which an intestinal bloody diarrhea had lasted several months. Repeated examinations for dysentery bacilli, amebas and other flagellates proved negative. A quantity of *spirochetes*, however, were found in the feces. Oral administration of an **arsenical preparation** was followed by improvement. A recurrence also subsided under the same treatment.

*Carriers* are relatively more numerous than is generally believed. Recruits and soldiers were examined by Saisawa and Tanabe (Philip. Jour. of Sci., July, 1926) to detect bacillus carriers as soon as they entered the service. Among the 2847 recruits, they found 15 healthy dysentery carriers (0.52 per cent.). Healthy carriers were also found among enlisted men who were living in the barracks in Tokyo. Fifteen men (0.32 per cent.) out of 4648 examined were found to harbor the dysentery bacillus. The types isolated from 30 carriers were the "Y" (Hiss-Russell) type in 17 cases, Flexner in 10, the non-fermenter of mannite in 2, and the typical Shiga bacillus in but 1 case.

**TREATMENT.**—According to Young (Trans. Royal Soc. Trop. Med. and Hyg., Jan. 31, 1927), the administration of more than 1 grain



(0.065 Gm.) of **emetine** daily for 6 days has an inhibitive effect on the production of what he terms the tissue-emetine substance which kills *Entamoeba histolytica*. Better results are obtained by giving emetine every 3 or 4 days after the first 6 grains (0.4 Gm.), or better still, if a microscope is available, by administering 1 grain (0.065 Gm.) of emetine 12 hours before the multiplication of amebas is due.

C. H. Harrison (U. S. Vet. Bur. Med. Bull., May, 1926) obtained good results from the use of **stovarsol** in the treatment of *amebic dysentery*. He administers 0.5 Gm. ( $7\frac{1}{2}$  grains) by mouth, 3 times daily. **Colonic irrigation** with from 4000 to 8000 c.c. (4 to 8 quarts) of physiologic **sodium chloride solution**, followed by 1:500 **mercurochrome**, was also employed.

S. Meyer (Arch. f. Kind., Nov. 11, 1927) extols the use of **citric acid milk** in the treatment of *dysentery of infants*. It is prepared by boiling whole milk for 5 to 10 seconds, then cooling quickly in cold running water. Next, 5 Gm. ( $1\frac{1}{4}$  drams) of powdered citric acid and the proper amount of sugar are added to each liter (quart) of milk; the mixture is stirred constantly so as to make a very fine curd. Each liter of this milk has a caloric value of 850 to 900. The acid content is constant; pH 4.4 to 4.5. The milk is given with rice gruel.

**DYSMENORRHEA.**—According to Sahler (Wien. klin. Woch., Nov. 25, 1926), the pain is caused by spastic conditions in the smooth muscles of the uterus. The spasms are brought about by various agencies that are partly of constitutional-

endocrin origin and partly nervous and psychic, acting through the vegetative nervous system.

In keeping with Sahler's view, Hertzler (Amer. Jour. of Obst. and Gyn., June, 1925) calls attention to the fact that many young women present small goiters associated with mild degrees of *thyrotoxicosis*. Anatomically their thyroid glands show changes in the colloid, inactive acinal epithelium and apparently an increase in the cells situated between the acini. Many of these patients have an associated dysmenorrhea without demonstrable anatomic changes in the pelvic organs. When they are treated in the conventional manner for their goiters, the dysmenorrhea disappears in the vast proportion of cases. This applies as well to the common *groin pains* so commonly diagnosed chronic appendicitis, for the relief of which appendectomy is wholly ineffective.

Laboratory and clinical observations led Schmitt (Zent. f. Gyn., Oct. 31, 1926) to the conclusion that in a large proportion of cases of dysmenorrhea there is a disturbance of thyroid function. Hyperfunction was found 33 times and hypofunction 7 times among 40 cases. In most instances enlargement of the thyroid gland was also present.

**TREATMENT.**—Lang (*ibid.*, Apr. 23, 1927) found that **ephedrine** is an efficient remedy in dysmenorrhea. It acts by stimulating the smooth musculature and sympathetic nerve-endings. It was given as soon as pain set in. From 0.01 to 0.05 Gm. ( $\frac{1}{16}$  to  $\frac{3}{4}$  grain) was given by mouth 2 or 3 times a day, according to tolerance, which is best determined by Aschner's eyeball pressure test.

The injection of a small amount of **vegetable protein intravenously** in spastic dysmenorrhea during the colic was found efficient by Vogt (Berl. klin. Woch., May 28, 1926), by decreasing, he contends, the irritability of the sympathetic.

In the course of 1700 operations for acute appendicitis and other appendiceal disorders, Harbin (So.

Med. Jour., Nov., 1927) noted that in certain cases nausea and vomiting, with or without pain, which had been more or less constantly present during menstruation, abruptly ceased after an uncomplicated **appendectomy**.

Three cases are cited in which a diseased appendix was the only discoverable pathologic condition present.

## E

**EAR, EXTERNAL.—DERMATITIS.**—Changes in the external ear following chronic suppurative otitis media of long standing range, according to F. C. Ormerod (Jour. of Laryng. and Otol., Mar., 1927), from a slight desquamative eczema to a massive perichondritis with deep fissures and stenosis of the meatus. Of the liquid applications used in 30 cases, solutions of **silver nitrate in spirit of ethyl nitrite** gave the best results, especially in cases with massive perichondritis or fissure. Among ointments used, **calamine** and **yellow oxide of mercury ointments** were especially effective. No positive cures, however, resulted.

**FURUNCULOSIS.**—According to Hemeleers (Arch. méd. belges, June, 1926), **autogenous vaccine** is the sovereign remedy in furunculosis of the auditory canal. As soon as pus has formed a deep, wide **incision** is made and a drop of pus used for preparation of the vaccine. The initial dose is 0.25 c.c. subcutaneously, followed by 0.5 c.c. on the 2d and 1 c.c. on the 3d and next 3 or 4 days. Vaccine therapy is also effective in *suppurating hematoma* of the external ear. The cavity having been cleaned out,

it is filled with bouillon vaccine for 10 minutes, then emptied and packed with gauze moist with the same vaccine. This is repeated daily for a few days, and recovery is soon complete.

**MYCOSIS.**—Regarding *otomycosis*, J. J. Chisholm and A. C. Sutton (Arch. of Otolaryng., Dec., 1925) state that 17 species of *Penicillium* and *Aspergillus* are pathogenic in man. In their 13 cases, 5 were infected with *Penicillium*, 4 with *Aspergillus*, and 3 with *Mucor*. Otomycosis is relatively common and should be looked for by careful examination for mycelia and spores in all cases of eczema and recurrent furunculosis of the external auditory canal and in atypical or long-standing discharge from the middle ear, particularly when such discharge is brown or dirty white. As a valuable adjunct to local treatment the writers advise prolonged use of **potassium iodide** internally, beginning with 5 grains (0.3 Gm.) 3 times daily and increasing gradually to 15 grains (1 Gm.) or more. This is continued until symptoms are relieved and the ear is free of discharge. After this, during 10 to 14 days, the patient takes no iodide but wipes out the canal daily with **alcohol** or a 2

per cent. solution of **salicylic acid in alcohol**. A 14-day course of iodide then follows, beginning with 10 grains (0.6 Gm.) 3 times daily and rapidly increasing to maximum tolerated dosage. After a 2-weeks rest the 14-day course is repeated. In obstinate cases such courses should be continued for at least 6 months. The intervals between courses allow the spores to develop into mycelia which are then killed by the next course. No water, oils or ointments should enter the ear. The iodide should be used with caution where staphylococcic infection coexists, because of the apparent inhibitory effect on the normal resistance to skin cocci.

**ECTOPIC GESTATION.—DIAGNOSIS.**—The physician is often misled in the diagnosis of this condition, according to E. Macias de Torres (Rev. esp. de obst. y gin., June, 1927), because only  $\frac{1}{5}$  of the cases show a true amenorrhea in the early stages. Even in the 2d stage, in rupture cases, appendicitis is likely to be the diagnosis of the general practitioner. The diagnosis in the 1st stage should be based on a juxta-uterine tumor and amenorrhea, especially if the tumor enlarges between successive examinations. Appendicitis may be excluded in the 2d stage by the situation of the pain, the irritability of the skin, the character of the fever, and particularly, the presence of uterine hemorrhage. Puncture of Douglas' pouch and the sedimentation test are also of assistance.

*Puncture of the cul-de-sac* is endorsed by L. Zeitlin (Mon. f. Geb. u. Gyn., Feb., 1926), having been performed without harm in 161 out of

636 cases of ectopic pregnancy in the Leningrad Clinic. Blood is obtained in 90 per cent. of the cases in which it is present in the abdominal cavity; failure to obtain it should not, however, rule out ectopic pregnancy. Puncture must be carried out exactly in the midline of the posterior fornix, and should be avoided in shocked cases. If pus is found mixed with the blood, if there is evidence of degeneration of the blood, or if there are bacteria in it, operation should be confined to a **posterior colpotomy**, and laparotomy avoided because it is dangerous under such conditions. When the puncture is followed by **laparotomy** the latter should be performed immediately.

*Shoulder pain* was observed in 2 patients with ruptured ectopic gestation by Danforth (Amer. Jour. of Obst. and Gyn., Dec., 1926), who considers the symptom of diagnostic import.

Where the diagnosis is doubtful, Liebe (Zent. f. Gyn., Apr. 24, 1926) endeavors to support it, where the patient is not in an obviously dangerous condition, by repeated *blood-pressure* and *hemoglobin* determinations, which may point to hemorrhage. Added evidence may be afforded by the *sedimentation test* and *leukocyte-erythrocyte ratio*.

The *leukocyte count*, according to a study in 150 cases by L. K. P. Farrar (Surg., Gyn. and Obst., Nov., 1925), fluctuates in ectopic gestation according to the amount of fresh blood being thrown into the peritoneal cavity and the rate of absorption. The count tends to drop to normal as the blood is absorbed or walled in. It was normal in 29 cases of unruptured tubal pregnancy. The polymorpho-

nuclear leukocyte count was increased markedly only in cases having fresh blood in the pelvis. A fluctuating leukocyte count with moderate elevation of temperature differentiates ectopic gestation from a purulent salpingitis, with its more uniformly high leukocyte count and fluctuating temperature. In rupture of tubal pregnancy the steadily rising leukocyte count indicates active bleeding before the fall in the red cells or hemoglobin gives warning of the condition. The leukocyte count must be taken at least daily and in critical cases even hourly, and used in conjunction with the history and clinical findings.

According to O. Pritzi and J. Lichtman (Wien. klin. Woch., Aug. 25, 1927), detection of *acetonuria* in patients deprived of carbohydrates is a very useful diagnostic sign of ectopic pregnancy, which permitted of a correct diagnosis in nearly 90 per cent. of their cases. The patient 1st receives a diet rich in carbohydrates for 2 days; next day, carbohydrates are excluded, and from 1 P.M. on, at 2-hour intervals, the patient is catheterized 5 successive times and the urine tested for acetone.

X-ray diagnosis of tubal pregnancy was successful in 10 cases reported, with illustrations, by P. Schneider and F. Eisler (Zent. f. Gyn., May 28, 1927).

**ECZEMA.—ETIOLOGY.**—Correlating the degree of cutaneous irritability and the mineral content of the skin in rabbits, J. V. Klauder and H. Brown (Arch. of Derm. and Syph., Jan., 1927) found an inverse relation between the degree of irritability and the amount of calcium in the skin

and a direct relation between the degree of irritability and the amount of potassium. In eczema the cutaneous neurocellular mechanism is out of equilibrium. The maintenance of the equilibrium of the salts of calcium, potassium, sodium and magnesium is intimately concerned with the vegetative nervous system and the endocrin glands and can apparently be influenced through altered metabolism of divers origin.

Diseases of the organs of elimination and metabolism were found by L. G. Beinhauer (*ibid.*, July, 1927) in 69.3 per cent. of eczema cases, as against 17.5 per cent. in the other common dermatoses. Investigation of elimination and metabolism in the individual case is necessary, and the results of treatment are better when it is based on such individual study.

While eczema may result from external irritant causes, endogenous irritants formed in the intestines through bacterial decomposition can also act as skin irritants in the presence of an allergic disposition. Of 109 eczema cases tested for a sensitivity skin reaction to various intestinal substances, 18 gave positive reactions, mostly to toxins produced by bacterial action on food products, but in a few instances to amino-acids normally occurring in the intestine. A history of flatulence or mild attacks of indigestion merits investigation. Urticaria-like eczemas, starting about the eyes and extending onto the face, of frequent recurrence, and chronic lichenified patches, are 2 types not infrequently associated with intestinal causes.

Eczema of the *hands* in *tomato canners* has been observed by G. Foà (Policlin., May 9, 1927), who ascribes



the condition to citric acid. An effective prophylactic measure consists in dipping the hands periodically into a vat of 1 per cent. **sodium hydroxide** solution, followed by water.

In a case of *eczema ani* reported by R. Gibson (Brit. Med. Jour., May 14, 1927), ingestion of *liquid petrolatum* for chronic constipation appeared to be the cause, recovery taking place only when the petrolatum was stopped.

**TREATMENT.**—L. Brocq (Paris méd., Jan. 15, 1927) advocates a careful inquiry into faults of hygiene and organ dysfunctions in the individual case. Eczema of congestive type may disappear upon **change of climate**, like asthma. Impressionable subjects should be treated by **rest in the open air amid quiet surroundings**. Toxic substances and toxins are to be excluded from the **diet**. In obstinate cases the writer puts into effect a **flushing out** of the system, or even complete **abstention from food** for 2 or 3 days. Locally, in very acute cases, **rest in bed** is indicated, with the affected area covered simply with **sterile talcum** and some fine, somewhat worn, repeatedly washed fabric. Itching and inflammation are allayed by **potato starch poultices**, prepared hot but applied cold, and renewed as soon as they become warm. Slightly moist sterile **compresses** may also be used, changed as soon as they dry out; where bacterial infection is suspected, these may be moistened with various **antistaphylococcic**, **antistreptococcic** or **polyvalent serums** or **vaccines**. In an initial attack of eczema the writer tries various local applications over different areas, to find out which acts best, *e.g.*, fresh **lard**; fresh **goose grease**; fresh **cold cream** made with

**spermaceti**; good quality **bees-wax** and **oil of sweet almonds**, without benzoin or rose water; fresh anhydrous **cerate**; a mixture of **hydrous wool-fat**, 10 Gm. (2½ drams), with 25 c.c. (⅝ ounce) each of **oil of sweet almonds** and **lime water**; **starch glycerite** made with pure neutral glycerin, which is usually tolerated in such cases only where the skin is naturally dry. These substances may be simply applied over the affected areas without further covering, or **powdered talcum** or **starch** dusted over them, or the application fixed with cigarette paper perforated with a needle or a covering of fine, used white fabric employed. Cleansing of the skin in these acute cases should be performed only with the material selected for local application.

In *papulovesicular eczema*, which has close affinities with urticaria and prurigo, Brocq cleanses the area, in cases with much inflammation makes tests with the various topical applications above referred to, and as soon as the inflammation is somewhat allayed promptly applies washed **crude coal tar**, which is the agent of choice in these **cases**.

In *psoriasiform seborrheic eczema* (*psoriasiform eczematized parakeratosis*), which stands between true vesicular eczema and true psoriasis, he recommends the following:

℞ *Ichthyolis* ..... 3ss (2 Gm.);  
*Zinci oxidi* ..... 3iss (6 Gm.);  
*Adipis lanæ hydrosi* . 3j (4 Gm.);  
*Vaseline* ..... 3ij (8 Gm.).—M.

Talcum is dusted over it. If the oozing persists, 1:20 to 1:10 of washed **crude coal tar** is incorporated in the formula.

According to Burgess (*loc. cit.*), small doses of **salines** are useful in

eczema even in the absence of constipation. *Bacillus acidophilus* appears to be the most effective of intestinal alteratives, while **mercury with chalk, calomel and sulphonated bitumen** may also be of service.

P. Hansen (Derm. Woch., Apr., 1927) thinks it can be assumed that eczema is in some manner related to an increased acidity of the blood. In 7 cases dealt with by **autohemotherapy**, alkalinity of the blood was increased, and 6 of the patients were cured. He believes the therapeutic action of the injected blood to be due to the proteins it contains. Lintvareff and Hamburg (Ven. i Dermat., Apr., 1926) applied **autohemotherapy** with good results in the following manner: Blood is withdrawn from the patient and treated with sodium citrate solution; the erythrocytes from 5 or 6 c.c. of blood are washed and injected into the patient himself. Injections are made at 2- or 3-day intervals and in several places, to obviate hemolysis. In some instances the erythrocytes from as much as 20 or 25 c.c. of blood were injected at 1 time. In 4 cases of acute or chronic weeping eczema, a cure resulted from 8 to 10 injections of the centrifugated erythrocytes, without local treatment. In dry eczema the treatment failed.

An **extract of hog's spleen**, according to L. von Zumbusch (Urol. and Cut. Rev., Dec., 1927), yielded striking improvement on subcutaneous injection in long-standing cases of eczema and of *bronchial asthma* refractory to all other treatment. He believes that in skin conditions attended with eosinophilia and in anaphylaxis defective functioning of the spleen is responsible.

**INFANTILE ECZEMA.**—Removal by steam distillation of a substance containing the active principle responsible for the benefit from **crude coal tar** in infantile eczema is reported by Nelson and Osterberg (Arch. of Derm. and Syph., June, 1927). From this separated product an ointment free from the tendency to cause folliculitis and the staining properties of coal tar has been prepared.

In infantile eczema due to sensitization to some protein the treatment, as noted by J. L. Webb (Amer. Med., Mar., 1927), consists of reducing the diet to very simple foods and searching for the causal substance. Any eroded, infected areas must be treated with mild antiseptics, such as **boric acid solution**. Relief from the itching may be procured by such internal remedies as **adrenalin** and **calcium**, either as **lime water** or as **calcium lactate**, and maintaining rather free bowel evacuation with **milk of magnesia**.

The use of a **heating screen** containing electric lamps for eczema and *pyoderma* in infants is endorsed by M. Allina (Mon. f. Kind., June, 1926). Overheating the child should, however, be avoided, and the treatment is not suitable in skin conditions of the face or scalp.

In *facial eczema* in infants who also had asthmatic bronchitis, J. P. Costello (Jour. Mo. State Med. Assoc., Oct., 1925) found an enlarged thymus present in a number of instances. On the supposition that the enlarged thymus might be the cause not only of the asthmatic bronchitis but also of the eczema, **X-ray treatment of the thymus** was carried out in 5 cases with convincing results. These were

infants with general adenopathy, enlarged tonsils and adenoids, widening of the sternal dulness on percussion, and widening of the tracheal breath sounds.

**EDEMA.**—Mauriac and Boutiron (C. r. Soc. de biol., Dec. 31, 1926), in rabbits with *experimental nephritis*, found altered ratio of sodium and chlorine in the system, as shown by determinations on the blood and muscles, a prominent feature. A reduction of potassium was also noted. Further, there appeared to be abnormal amounts of phosphorus and calcium in the system. Thus, antagonism of different ions seems to be the cause of hydration or dehydration of tissues in nephritis.

Sordelli's discovery of a new putrefactive anaërobic germ which is a cause of *malignant edema* in human gangrenous infections is confirmed by I. C. Hall and J. P. Scott (Jour. of Inf. Dis., Nov., 1927). The organism combines the virulent properties of *B. novyi* with the principal morphologic and cultural properties of *B. sporogenes*. For Sordelli's original appellation, *B. edematis-sporogenes*, the writers would substitute *B. Sordellii*.

In 1923, W. B. McClure and C. A. Aldrich (Jour. Amer. Med. Assoc., July 28) described the rapid disappearance, in children with edema, of the cutaneous elevation produced by intradermal injection of 0.2 c.c. of 0.8 per cent. salt solution. They suggested that this *intradermal salt solution test* might be of value for detecting and tracing disturbed water balance in the tissues. Later (*ibid.*, May 3, 1924), they reported the test to be a valuable method for determining immediate prognosis of conditions in children characterized by generalized edema, with albumin, casts and, in some cases, red blood cells in the urine,

but unassociated with nitrogen retention in the blood. W. J. Baker (*ibid.*, Nov. 15, 1924) found the result of the test proportionate to the severity of the intoxication in *scarlet fever* and *diphtheria* and deemed it of prognostic value in these disorders. The normal disappearance time of the salt solution is considered as being longer than 1 hour in children, and somewhat longer still in adults. M. M. Kunde (Arch. of Int. Med., July, 1926) found that in *acute nephritis* the disappearance time fell to 30 minutes or less before edema could be detected with Schade's elastometer, and in *acute toxemias of pregnancy*, to about 10 minutes. In *chronic nephritis* with albuminuria and nitrogen retention, no edema could be demonstrated with the elastometer and the disappearance time was normal. In acute nephritis with disappearing edema the elastometer curve becomes normal several days or weeks before the disappearance time does. In *cardiac edema* the disappearance time may become normal as soon as the elastometer has shown subsidence of the edema.

**TREATMENT.**—Administration of calcium and potassium salts in edema is advised by Baráth (Terap. Contemp., June 15, 1926), both to promote elimination of sodium and exert a direct action on the kidneys. In edema due to heart disease **calcium chloride** or **lactate**, 45 to 75 grains (3 to 5 Gm.), also enhances the action of digitalis.

P. Iversen (Ugeskr. f. Læger, Jan. 20, 1927) states that 3 factors govern the development of edema, *viz.*, the hydrostatic pressure in the capillaries, the colloid-osmotic pressure of the blood, and the permeability of the capillary walls. In nephritic edema, which is due to decreased colloid-osmotic pressure, the indication is to increase this pressure. **Blood transfusions** and **diuretics** have only a slight or transitory effect. The **proteins** in the diet should **not** be **reduced**. In cardiac edema it is neces-

sary to decrease the hydrostatic pressure in the capillaries. This is done by **rest in bed** and **heart tonics**. Absorption of cardiac edema is also promoted by **diuretics**. The same observer, with Nakazawa (*ibid.*, July 14, 1927), reports the finding in both acute and chronic albuminuria of a colloid-osmotic pressure so low as to account for the edema. They regard the albuminuria *per se* as of great pathogenic significance.

**EMBOLISM.**—In *air embolism*, according to Hutter (Mitteil. a. d. Grenzgeb. d. Med. u. Chir., xl, 205, 1927), if the embolism is arterial, the least quantity of air suffices to cause death. In venous embolism, however, if confined to the right heart and pulmonary vessels, and especially if the quantity of air is small, the prognosis is not necessarily fatal. A patulous foramen ovale may lead to the transformation of a venous into an arterial embolism. Veins having slight contractility are particularly prone to air embolism, as in osteotomies on limbs, skull trephining, goiter operations, and removal of the axillary glands in mammary cancer.

In the prophylaxis of arterial air embolism, **morphine** given previous to operations under local anesthesia and post-operatively is of service. Against venous embolism, a bloodless field in operations on the long bones; permitting a cavity to fill with blood where there is danger of air entering veins in its floor; covering a wound with wet cloths, or passing a stream of salt solution over it, are suitable measures. In chest operations quiet, shallow breathing reduces the risk of lung puncture; positive pressure should be ready for in-

stant use. Stiff drains are to be avoided. In actual embolism, there is disagreement as to the remedial measures to be used. The X-ray may assist in deciding upon an operation on the heart.

In a case reported by Chacko (Indian Med. Gaz., Mar., 1926), an infected embolus from an inflamed varicose vein lodged in the spinal vessels, inducing an acute myelitis with complete paraplegia.

**TREATMENT.**—Out of 109 cases of **embolectomy** collected from the literature in 1927 by Dschanelidze and Ogloblina, 74 had been performed in Sweden, largely through the advocacy of the operation by Einar Key. The latter observer (Zent. f. Chir., Aug. 27, 1927), discussing the utility of the operation in functional disorders of embolic causation in extremities, states that the chief localizing feature of the embolus is the absence of pulsation in the affected artery. **Embolectomy** should be carried out under local anesthesia. Results are best when the operation is performed within 10 hours after the onset of symptoms. Under these conditions he had good results in  $\frac{3}{4}$  of his cases involving the axillary and brachial arteries, in  $\frac{1}{2}$  of those in the femoral artery, in  $\frac{1}{3}$  of those in the iliac artery, and  $\frac{1}{7}$  of those in the aorta. Severe circulatory disturbance in a limb is the indication for the operation, which is futile, however, if not performed within 24 hours after the onset. The writer moistens the silk and instruments used with petrolatum and sodium citrate solution, and follows Carrel's technic.

Among 74 reported cases of **embolectomy** for threatening gangrene of the extremities, G. Nyström (Acta



chir. Scand., May 21, 1926) found that over  $\frac{1}{3}$  had been successful. Among 5 personal cases 3 recovered, although 1 of these later required amputation for gangrene in spite of the restoration of circulation. In a woman of 64, emboli in both femoral arteries in the groins were removed by **arteriotomy** over the emboli. Where, in embolism at the aortic bifurcation or in the common iliac, the embolus cannot be extracted with a sound passed into the vessel, a hand may be passed in retroperitoneally from the groin and the embolus milked down to the femoral artery for convenient removal. Embolectomy is not definitely contraindicated by arteriosclerosis.

**EMPHYEMA.**—Good results in 5 cases are reported by E. E. Butler (Ky. Med. Jour., Sept., 1927) from the use of **dressings** and **irrigation** of the cavity with sterile **saline solution**. No rib resections were performed. In 1 case, in a boy of 3 years, there was an accumulation of fibrinous material in the pleural cavity which obstructed drainage; the introduction of 20 to 30 c.c. of saline solution dissolved this material so that it could be withdrawn. The method of drainage used by the writer is the **closed catheter method**. The side of the chest is strapped with adhesive plaster and the catheter is kept closed. Pus is withdrawn at intervals as required, *e.g.*, every day or on alternate days, with a large syringe adapted to the outer end of the tube. The catheter must be inserted to a point low enough to drain the cavity completely. J. B. Lukens (*ibid.*) favors the Mazingo **closed method**, and never does a rib resection in acute

empyema, although believing **rib resection** the best procedure in chronic cases of long standing. Irrigation is of no advantage. Seepage of pus around the drainage tube is obviated by folding the gauze and punching a hole through it with the trocar instead of cutting a hole with scissors.

In acute empyema Larson (Cal. and West. Med., Aug., 1927) favors simple measures such as repeated **aspirations**, **closed drainage** and **thoracotomy** later if necessary. In chronic empyema, expanding the lung to the chest wall rather than collapsing the chest wall to the lung should be emphasized. He endorses the use of a **constant suction apparatus** to facilitate cavity collapse, as well as **irrigation** with **Dakin's solution**. Injection of iodized oil into a cavity is very useful in ascertaining the complicating factors which promote chronicity. Fourteen cases of acute empyema with 1 death are reported.

In deciding on a point for **puncture** in an *encapsulated empyema* Weisz (Deut. med. Woch., Apr. 23, 1926) sometimes makes use of the bulging of the intercostal grooves visible when the patient speaks and, in particular, repeats the word "kitt." Inspection for the bulging may show a point for puncture even where the remainder of the pleura is thickened.

A practical drainage tube for use in the **closed method** of empyema drainage is described by F. M. McGuire (Jour. Amer. Med. Assoc., Aug. 28, 1926). At a point sufficiently high to prevent the tube from coming in contact with the diaphragm an opening between ribs is made by incision and trocar and the tube inserted. If it touches lung it is withdrawn slightly. A rubber collar or gauze is placed between a shoulder on the tube and the chest wall. The tube leads to an airtight bottle on the floor, provided with

a one-way valve, permitting egress but not entrance of air. Tubes of different sizes are used, as any tube put through the chest wall will leak in 7 or 8 days; a larger tube is then inserted. A too rapid withdrawal of pus is to be avoided. After 24 hours, irrigation with 1:3 surgical solution of chlorinated soda is carried out at least twice daily. Under this treatment patients regain strength rapidly.

To promote reëxpansion of the lung in empyema Churchill (Boston Med. and Surg. Jour., Apr. 8, 1926) employs carbon dioxide inhalations. Unpleasant side-effects do not occur with this method. The CO<sub>2</sub> inhaler as employed by Henderson in the de-etherization of post-operative cases is used. The tank is left at the bedside and the duration and frequency of the exercise are varied to suit the needs of the case. The average ambulatory convalescent inhales the gas for 5 minutes 15 or 20 times a day.

In empyema following artificial pneumothorax in the tuberculous, C. Mainini (Semana méd., June 17, 1926) obtained remarkable benefit, in cases without fistula, from washing out the pleural cavity with an antiseptic solution. Even in the most obstinate cases, repetition of the lavage initiated general improvement. The lavage is preceded by evacuation of the pus and followed by insufflation of air.

In pneumococcus empyema in children, P. Leitner (Mon. f. Kind., Jan.-Feb., 1928) finds pleural irrigation with 0.5 per cent. ethylhydrocupreine hydrochloride solution of marked service. Seven out of 8 cases were cured and in the 8th case, suffering in addition from tuberculosis, there was marked improvement. Early treatment is advantageous, and the 1st, 2d and 3d injections should be given at

intervals of 3 or 4 days. The safe dosage is 0.025 Gm. ( $\frac{5}{13}$  grain) of the drug per kilo ( $2\frac{1}{5}$  lbs.) of body weight. In the same form of empyema in children, C. Cocchi (Riv. di clin. ped., June, 1927) makes use of the lytic action of bile salts on pneumococci. The pus is first aspirated, the pleural cavity next washed out with saline solution, and, in infants, 10 c.c. ( $2\frac{1}{2}$  drams) of saline solution containing 1 to 1.5 Gm. (15 to 23 grains) of sodium taurocholate then injected. In children of 2 or 3 years the dose is raised to 2 Gm. (30 grains). Two or 3 irrigations and injections suffice.

Makai's method of reinjecting subcutaneously pus obtained from the focus of suppuration (autopyotherapy) was used successfully by H. Flesch (Mon. f. Kind., Nov., 1927) in an infant of  $8\frac{1}{2}$  months with extensive empyema. In the course of 8 weeks 13 punctures were carried out and each time 0.25 to 1 c.c. (4 to 16 minims) of the pus injected in the back. Both in this and in a similar case in a child of  $6\frac{1}{2}$  months the empyema was absorbed following the treatment.

### ENCEPHALITIS.—EPIDEMIC.

—SYMPTOMS.—Among recently observed atypical forms of epidemic encephalitis De Massary (Encéphale, Dec., 1927) describes sensory-motor, psychic, neurovegetative and endocrin varieties. F. Glaser (Mon. f. Kind., June, 1926) saw in children, during the epidemic of influenza and encephalitis, 5 cases of a meningitic form, characterized by prolonged sleep, convulsions and other evidences of meningeal irritation. Three cases recovered completely while 1 retained some nervous symptoms and 1 had a persistent defect of brain functioning.

Seizures of the type of *subcortical epilepsy* in epidemic encephalitis are described by G. Sokolansky (Zeit. f. d. ges. Neur. u. Psych., Feb. 9, 1928). In this condition consciousness is completely retained and the convulsions are usually tonic and may involve the eye muscles. Sometimes there is a severe general myoclonia, and occasionally torsional movements of the body. Psychically, the patient may exhibit a definite emotional state, e.g., anxiety, hatred of fellow man, or disgust at life, along with or previous to the subcortical seizures; or, an impulse-aggressive type of conduct may be manifest during the attack. At times the emotional disturbance alone features the paroxysm, convulsions being absent.

Eight cases of a condition resembling the *acute serous encephalitis* of Brown and Symmers were observed by Stooss (Schweiz. med. Woch., Aug. 7, 1926) in children previously healthy. The cases arose in a restricted area and within a short time, but there was nothing to indicate epidemic encephalitis. In 1 case there were merely brief clonic muscular spasms. All the cases cleared up completely.

*Post-encephalitic sequelæ* have been discussed by rather numerous writers of late. Dennig and Voellm (Deut. Arch. f. klin. Med., June, 1927) state that patients in good condition from 1 to 4 years after the onset are likely to remain so, while those more seriously affected are apt to become worse. Mental deterioration is especially likely where the patients are left to themselves.

P. K. McCowan and L. C. Cook (Lancet, June 30, 1928) have published an important paper presenting a classification of the *mental disturbances* resulting from chronic epidemic encephalitis. The encephalitic tem-

perament, they find, is marked by a simple, childish outlook and a regression in emotional values, well seen in the morbid craving for attention exhibited by nearly all sufferers. This temperament seldom exists alone, however, and is often overshadowed by more striking features which the writers classify thus: (a) Bradyphrenic. (b) Depressed: (1) Reactive; (2) agitated; (3) hypochondriacal; (4) psychasthenic. (c) Paranoid: (1) Systematized delusions; (2) unsystematized delusions. (d) Apache: (1) Delinquent; (2) restless. In the bradyphrenic type, comprising the main body of Parkinsonians, there is a retardation of cerebration, usually proportionate to the physical retardation (bradykinesia). There is an unpleasant sense of effort in initiating thought or movement, with poverty of ideation as a natural corollary. For this "mental viscosity" no localized lesion could account. Reactive depression depends upon the peculiar sensitiveness of the patient to the gravity of his disease and is mainly evident in the early stages of Parkinsonism. The patient feels his increasing disabilities becoming an intolerable burden, which, added to his regressive temperamental changes, frequently leads to thoughts of suicide. The paranoid type made up 10 per cent. of the writer's patients; these subjects are preëminently suitable for a mental hospital. The apache syndrome comprises various irregularities of behavior, from mischievousness to serious crime. It is seldom found in patients who have passed adolescence at the time of their primary attack. The symptoms may, however, continue indefinitely. Motor restlessness is a striking feature, with wandering and pugnacity.

Tics and nervous habits are common, and peculiar anomalies of gait are seen, such as flexing 1 knee at every step, constantly changing step, revolving round, and even somersaults. One group provides a picture of "moral imbecility" which is seldom seen outside of encephalitis. Prominent in some apache cases, with or without Parkinsonism, are periodic outbursts of acute excitement, which may last for several days, and during which the patient may be noisy, destructive, impulsively violent, and sometimes hallucinated.

*Conjugate movements of the eyes* after epidemic encephalitis were witnessed in 13 cases by E. W. Taylor and C. A. McDonald (Arch. of Neur. and Psych., Jan., 1928). There was a forced upturning of the eyeballs coming on in intermittent attacks of varying duration; in 4 this was combined with lateral movement. The intervals between attacks usually exceeded 24 hours, and the duration of the attacks from 1 or 2 minutes to 9 or 10 hours. In several cases the spasm would disappear in recumbency. Treatment, largely by **scopolamine**, was definitely effective in 8 cases and without result in 2.

In a case recorded by Vivaldo (Prensa méd. Argent., May 20, 1926), there were ocular spasms and mental disturbances beginning 2 years after encephalitis. Palilalia was pronounced, each phrase spoken being repeated several times.

Localized contraction of the pre-vertebral muscles through release of a primitive postural reflex accounts for the *spinal curvatures* following encephalitis, according to the observations of R. G. Abercrombie (Brit. Med. Jour., Feb. 4, 1928) in 5 cases.

Material improvement in such cases follows the use of **corrective apparatus** calculated to overcome the resistance of the muscles, reduce the curve and prevent bony deformity.

**ETIOLOGY.**—No valid proof exists of the identity of the virus of herpes and that of epidemic encephalitis, according to Zinsser and Tang (Jour. of Exp. Med., July 1, 1926). Either the 2 viruses are entirely unrelated or else prolonged sojourn in the central nervous system of man attenuates the virus for rabbits to an extent analogous to that in which rabies virus is attenuated for man by passage through rabbits.

**TREATMENT.**—That there is evidence that acute epidemic encephalitis is benefited by **salicylate** therapy is recognized by S. H. Epstein, R. K. Farnham and S. Cobb (Boston Med. and Surg. Jour., Feb. 16, 1928). The careful observations of the French indicate the following sequence of events in the acute cases thus treated: First, the infectious signs disappear; then, in turn, neurologic signs, restlessness, myoclonic movements and headache. Such treatment given early may prevent the development of Parkinsonian symptoms, but, since cases have not been followed for long periods after the acute stage this cannot be looked upon as proven. The conception of a persistent chronic infection existing in Parkinsonism, as advocated by W. Freeman, is now generally conceded. The writers' attempts to benefit cases of *chronic* encephalitis by weekly intravenous injections of sodium salicylate were unsuccessful.

Good results are reported by Simonena (Med. Klin., June 4, 1926) in acute cases from daily intravenous



injections of 5 c.c. (80 minims) of a 40 per cent. solution of **methenamine**, continued for about 10 days.

According to W. Freeman (Jour. Amer. Med. Assoc., Oct. 15, 1927), **salicylates** in encephalitis often give as favorable results as in rheumatic fever. **Acetylsalicylic acid**, 0.3 Gm. (5 grains) every 3 hours, is perhaps best tolerated. In intravenous medication, used where the stomach rebels, **sodium salicylate**, 1 to 1.5 Gm. (15 to 23 grains) in 10 per cent. solution with 10 per cent. dextrose, is given daily or oftener; the dextrose prevents the obliteration of the veins. **Lumbar puncture** is used freely in cases with excitement or signs of meningitis, and it seldom fails to relieve headache and convulsions. **Milk injections, colloidal silver** or other metallic preparations have had strong advocates. The writer, with A. C. Evans, in 1926 isolated a neurotropic streptococcus, identical with that described by Rosenow, which they believe to be the cause of the disease and with which they prepared an **immune serum**. This was used in 9 acute cases, with notable improvement. In 1 case, however, with repeated relapses, injection of **normal horse serum** during 1 relapse, of **anti-pneumococcus serum** during another, and of **streptococcus bacterin** during a 3d yielded the same benefit that the encephalitis serum had given in the 1st place. **Blood transfusion** (500 c.c.) is 1 of the most useful measures in combating severe encephalitis. The writer favors active measures during the period of good health following the acute illness in order to forestall the chronic progressive forms. To this end, all **foci of infection** about the mouth and nose should be elimi-

nated and resistance against the specific organism increased by the use either of an **autogenous vaccine** where a streptococcus has been cultivated from the blood during the acute state, or, in other cases, of a **stock bacterin** from some other case of encephalitis. In the established chronic stage the same measures are indicated, and **intraspinal injections** of the patient's **own serum** should be given special consideration. In the rigidity of Parkinsonism, if **scopolamine** is not effective, **atropine** may be used and often has a salutary effect on oculogyric spasms, when present. Greatest relaxation is accomplished by the **hot bath**. A. L. Skoog (*ibid.*) in the acute cases favors **methenamine**, pushed to the maximum degree, with the urine watched carefully for signs of renal irritation. W. House (*ibid.*) emphasizes the great palliative benefits of **scopolamine** in Parkinsonian cases.

In a grave case of acute encephalitis, A. W. Fuller (Lancet, July 24, 1926) gave an intravenous injection of a 0.05 per cent. suspension of **gold-silver colloid**, with resulting return to consciousness in an hour and general improvement. Two more injections were given intramuscularly soon after. Eight days later the injections were resumed daily for 4 days. By the end of the 6th week, all symptoms had disappeared.

In the prolonged forms and sequelæ of encephalitis J. M. Sacaze (Bull. méd., Apr. 27, 1927) recommends **arsylene**, a French preparation of allylarsinic acid. Large doses are required. Either 0.2 Gm. (3 grains) may be injected intramuscularly on 15 to 20 successive days, or, after this dose has been given for 4 days, 3 days of rest are allowed, then 0.4

Gm. (6 grains) is given for 4 days, 3 days rest allowed, then 0.6 (9 grains) given for 4 days, then the dose progressively reduced in the same scale. Tingling in the fingers requires cessation of the medication. After the 1st "attack" course, 0.05 to 0.1 Gm. ( $\frac{3}{4}$  to  $1\frac{1}{2}$  grains) is injected daily for several weeks, after which another intensive course is given. The treatment acts rapidly and constantly on the hypertonicity of Parkinsonism.

In 8 chronic cases, Sepp, Liwschitz, Schargorodsky and Scheimann (Arch. f. Psych., lxxxii, 61, 1927) observed definite improvement from measures to increase oxidation such as **inhalations** and **subcutaneous injections of oxygen** or intramuscular injections on alternate days of 1 Gm. (15 grains) of **potassium permanganate** in a 1 per cent. solution. There resulted a lessening of exhaustibility, a decrease of the vegetative disorders, increased emotional and motor activities, and better sleep. The method is contraindicated in patients with pulmonary tuberculosis.

**PERIAXIALIS DIFFUSA.**—In the differentiation of *encephalitis periaxialis diffusa*, or **Schilder's disease**, from disseminated sclerosis, according to T. G. Stewart, J. G. Greenfield and M. A. Blandy (Brain, Mar., 1927), the chief criteria are the loss of hearing and progressive and complete loss of vision. Pathologically, the symmetric and diffuse nature of the demyelinated areas and the destruction of axis cylinders in them at an early stage are differential features. In a case reported by G. Schaltenbrand (Arch. of Neur. and Psych., Dec., 1927), a girl of 14 years, admitted because of suspected appendicitis, showed during the 1st examination

apathy and a right-sided facial weakness and optic neuritis. She gradually developed choked disc and signs of extensive bilateral lesions of the brain. She died after 3 months, in a state indicating practically complete disappearance of all cortical functions. The brain showed widespread softening and disintegration of the white matter of both hemispheres, with the gray matter in general spared. The corpus callosum was involved, and the process extended downward as far as the midbrain and the chiasm.

In a case in a girl of 19 years reported by Barré, Morin, Draganesco and Reys (Rev. neurol., Dec., 1926), the initial symptoms had been diplopia followed by weakness and tingling in the right arm and leg. Two years later right-sided hemiplegia developed, with vomiting and occasional cramps in the right arm and leg, stiff neck and the head turned to the right. Bilateral choked disc then developed, but operation revealed no tumor. Some months later a fixed position of adduction of the arms and semi-flexion of the elbows developed. The head was turned from side to side and there was grinding of the teeth and paroxysmal weeping. Death followed a series of attacks of rigidity. The brain showed atrophy of the white matter of the corpus callosum and especially the frontal and temporal lobes. There was extensive destruction of myelin sheaths, and accumulation of granule cells, with large glia cells such as those of pseudosclerosis. Descending degeneration in the pyramidal tract of the pons, medulla and cord was found.

C. P. Symonds (Brain, Mar., 1928) presents evidence to the effect that

Schilder's disease may have a familial incidence.

**ENDOCARDITIS.**—Among 28 cases of *subacute bacterial endocarditis* analyzed by F. J. Smith and D. M. Brumfiel (Jour. Mich. State Med. Soc., Apr., 1927), there was a history of rheumatic fever and tonsillitis in 14; scarlet fever, 5; chorea, 2; oral sepsis, 10; influenza, 4. The initial symptom was asthenia in 10 cases; headache, 4; abdominal pain, 4; cough, 5. Among 21 cases yielding a positive blood culture, the organism was identified as *Streptococcus viridans* in all but 2 cases. The tonsils, nasal sinuses and abscessed teeth seemed the most likely avenues to the blood-stream. Prevailing symptoms were: Asthenia, 27; loss of weight, 18; anorexia, 12; arthritis, 8; dyspnea, 14. There was anemia in 18, clubbed fingers in 13, petechial hemorrhages in 22, and palpable spleen in 11. Evidence warranted a diagnosis of aortic insufficiency in 9; aortic stenosis, 1; mitral insufficiency, 21; mitral stenosis, 15; in 4, congenital heart defects were suspected. There was evidence of embolism in 24, and albuminuria in 21.

From 65 cases of the same disorder, L. M. Hurxthal (Boston Med. and Surg. Jour., July 14, 1927) offers the rarity of clubbed fingers in the absence of a palpable spleen—except in congenital lesions—as a differential diagnostic sign of subacute bacterial endocarditis. Precordial pain is usually associated with an aortic lesion. The presence of auricular fibrillation is against the diagnosis of this disease. The clinical diagnosis rests essentially on embolic manifestations in various parts of the body. Cases

with central nervous system involvement suggest an aseptic meningitis. M. A. Rothschild, B. Sacks and E. Liebman (Amer. Heart Jour., Apr., 1927) concluded from 123 cases that auricular fibrillation and subacute bacterial endocarditis in the active or bacterial phase are mutually exclusive, but that auricular fibrillation is observed in the bacteria-free or healed stage with perhaps the same frequency as in chronic rheumatic valvular disease.

Detection of *digital lesions* in the form of Osler nodes, tender digits, splinter hemorrhages or clubbing of the fingers is regarded by G. Blumer (*ibid.*, Feb., 1926) as of great value in the diagnosis of doubtful cases of subacute bacterial endocarditis.

*Night cough* is stressed by Hatziganu, Telia and Daniello (Bull. Soc. méd. des hôp. de Paris, Mar. 26, 1926) as having occurred in 80 per cent. of their cases of *chronic infectious endocarditis*. The cough paroxysms always came on before midnight. Their intensity corresponded to the fever present, and the cough sometimes increased just before fever was to reappear. The cough preceded all clinical evidences of cardiac insufficiency, and is ascribable to a recurrent bronchitis accompanying the endocarditis. The consequent increased irritability of the nerve-endings in the lungs would be further accentuated by the recumbent position at night, cough resulting.

**TREATMENT.**—In a case of *acute malignant endocarditis* recorded by K. M. Howell, B. Portis and D. A. Beverley (Jour. of Inf. Dis., July, 1926), in which both *Streptococcus hemolyticus* and *S. viridans* were isolated from the blood on 3 occasions, 12

immunotransfusions were given in the course of 5 months. The observed increase in specific antibodies in the patient's blood, both as compared with its own original content and with that of the immune donors, pointed to the development of both active and passive immunity as a result of the procedure.

According to G. Marchal and A. Jaubert (Bull. méd., Jan. 25-28, 1928), the only reported case of cure of a secondary malignant endocarditis of slow evolution has been that of Thayer, in which intravenous injections of 3 per cent. magnesium sulphate solution, autogenous vaccine, and injections of polyvalent anti-streptococcus serum were administered.

In recurring ulcerative endocarditis (*endocarditis lenta*) when the clinical manifestations indicate a marked participation of the spleen, Heilborn (Med. Klin., Apr. 1, 1927) has found splenectomy of benefit.

**ENDOCRINS.** See the various individual glands.

**ENTEROPTOSIS.** See VISCEROPTOSIS.

**ENURESIS.**—Out of 90 cases of enuresis in children treated by A. I. Blau (Med. Jour. and Rec., Oct. 20, 1926), 75 received pituitary extract by mouth,  $\frac{1}{10}$  to  $\frac{1}{4}$  grain (0.006 to 0.015 Gm.), in gradually increasing doses, 3 times daily, and in 54 of these, hypodermic injections of pituitrin, 8 minims (0.5 c.c.), were also given, usually in a series of 3 injections at 3-day intervals. The combined results were: Improved, 21; cured, 16; unimproved, 7; not observed, 10. Of the 54 cases receiving

injections, 37, or nearly 75 per cent., were either cured or improved. These results contrasted strikingly with the unsatisfactory effects previously obtained in the same patients with the various other drugs commonly recommended and with operative or constitutionally acting measures.

In 20 cases of enuresis in female children Mattes (New Orl. Med. and Surg. Jour., Nov., 1927) had satisfactory results from instillations of 2 per cent. silver nitrate solution. The duration of treatment ranged from a few weeks to 5 months. Six cases were discharged as cured, and 12, after improvement, did not return for further treatment.

In 39 children with enuresis, A. Friedell (Amer. Jour. Dis. of Childr., May, 1927) found psychic treatment in the form of the sterile water hypodermic successful in 87 per cent. of cases. The treatment included restriction of fluid intake after 4 P.M., abstention from tea, coffee, and highly seasoned food, and retiring to bed at 7.30 P.M. on a hard mattress. Each child was given a hypodermic of 1 c.c. (16 minims) of sterile water once a week and was assured that this would result in a cure, with the warning, however, that should a relapse occur, additional injections would be administered. The great majority of the cases required only 1 to 3 injections. Cure was recorded only when there was no relapse in 6 months. The age of the children ranged from 4 to 13 years. Some patients were found to have a persistent reversal of concentration of the urine, the specific gravity of the day specimen being greater than of the night specimen; in these cases the psychic treatment failed.



Irradiation with the ultra-violet rays over the sacrococcygeal joints proved effective in 7 cases of enuresis in children treated by E. M. Pueyrredon (Prensa méd. Argent., Sept. 20, 1927). From 1 to 9 treatments were required.

According to L. Casper (Deut. med. Woch., July 15, 1927), the best method of treating incontinence of urine in women is surgical diathermy to the urethra, which results in contraction of the surrounding tissues. In milder cases the writer has had success with very hot sitz-baths in which a few pounds of salt had been dissolved, combined with hot vaginal douches.

In a multipara with incontinence after operations for cystocele, etc., Gammeltoft (Hospitalstid., Feb. 25, 1926) performed with successful results the Goebel-Stoeckel operation, in which the pyramidalis or rectus muscle is employed to make a ring around the urethra.

**EPHEDRINE.**—Ephedrine is an alkaloid isolated from the Asiatic drug, ma huang, botanically known as *Ephedra vulgaris*, var. *helvetica*. While in use in Chinese medicine for over 5000 years, ephedra remained practically unknown in the West until brought to light by the researches of K. K. Chen and C. F. Schmidt during 1924 to 1926.

The empirical formula of ephedrine is  $C_{10}H_{15}ON$ , and its chemical structure is asserted to be  $C_6H_5 \cdot CHOH \cdot CH(NHCH_3) \cdot CH_3$ , or 1-phenyl-2-methylaminopropanol-1. It is closely related, chemically and pharmacologically, to epinephrine (adrenalin), tyramine, and phenyl-ethylamine.

**DOSE AND MODES OF ADMINISTRATION.**—The dose of ephedrine by mouth ranges from  $\frac{1}{2}$  to  $1\frac{1}{2}$  grains (0.03 to 0.09 Gm.). It is available not only in the form of the alkaloid, but also in the sulphate, which contains  $74\frac{1}{2}$  to  $77\frac{1}{4}$  per cent. of the alkaloid, and the hydrochloride, containing 80 to  $82\frac{1}{2}$  per cent.

Ephedrine, usually in the form of its salts, may be given subcutaneously, intramuscularly or intravenously in the dose of  $\frac{1}{2}$  grain or more. By the mouth, it is best given in capsules or a syrup, to mask the taste of the ephedrine salt. For intranasal use, a 3 per cent. aqueous solution of one of the salts, and an "inhalant" consisting of a 1 per cent. solution of the alkaloid in light mineral oil, are most commonly availed of. A 10 per cent. solution of ephedrine sulphate has been used for mydriatic purposes.

Ephedrine has certain advantages over epinephrine in that its solutions are stable indefinitely even when exposed to light and air and are not decomposed by boiling.

**PHYSIOLOGIC ACTION.**—Ephedrine resembles adrenalin closely in its action, the chief differences being that it is less powerful, much more prolonged in action, and more dependable when given by the mouth. In man, in a dose of 1 grain by the mouth, the drug causes a rise of systolic and diastolic blood-pressure with slowed heart-rate (Edmunds), together with some throbbing in the head and a sensation of palpitation. These effects may continue for 2 hours or more.

Experiments in animals reveal, in conjunction with the prolonged rise of blood-pressure, an increase of heart-rate ascribed to accelerator stimulation; in man, however, there may be an added stimulation of the cardioinhibitory mechanism, accounting for a slowed rate. Ephedrine induces, in particular, a prolonged vasoconstriction in the splanchnic area. It also relaxes contracted bronchial muscles, inhibits intestinal activity, and exerts a peripheral pupillodilator action. It causes contraction of the uterus in various animals. According to De Eds and Butt (Proc. Soc. Exp. Biol. and Med., May, 1927), ephedrine is not, like epinephrine, sympathomimetic in its actions on the blood-pressure, uterus, and probably the bronchi, but acts directly on the muscle tissue instead of on the "receptive substance" (myoneural junction).

The rise in blood-pressure produced in man by ingestion of 0.06 Gm. (1 grain) of ephedrine was found by Chen and Schmidt to amount to 20 to 30 mm. Hg. It took place in 15 to 30 minutes and persisted for 3 or more hours. In anesthetized dogs,

ephedrine given intravenously in a dose 500 times that of adrenalin caused a rise in blood-pressure equal to that from adrenalin but lasting 7 times as long. Rudolf and Graham, injecting 0.005 Gm. of ephedrine intravenously in a dog, observed an immediate rise of pressure from 75 to 200 mm. Hg, which was still maintained 11 minutes later. In the human eye, ephedrine induces mydriasis beginning in 15 to 30 minutes after instillation, reaching its maximum in 30 to 60 minutes, and lasting from 3 to 9 hours (Middleton and Chen).

Applied locally to mucous membranes ephedrine exerts, by vasoconstriction, a blanching and shrinking effect similar to that of adrenalin. Applying a 5 per cent. solution to the nasal mucosa, Rudolf and Graham observed a pallor which was not as great as that following adrenalin but lasted very much longer; there were no unpleasant sequelæ.

Hyperglycemia can be produced by injection of ephedrine, as by adrenalin, but much larger amounts are required and the maximum effect obtainable is less.

**TOXICOLOGY.**—Toxic doses of ephedrine stimulate the central nervous system and depress the heart. According to Middleton and Chen, limiting the dosage to 0.06 to 0.09 Gm. (1 to 1½ grains) in man will avoid the perspiration, tremor, palpitation and faintness sometimes observed after larger doses. (In their clinical tests these observers used doses by mouth up to 0.4 Gm.—6 grains.)

It is recommended that use of ephedrine be avoided in cases with hyperthyroidism, in nervous patients, and in cardiac disease where a possible depressant effect on the heart might be prejudicial.

**THERAPEUTICS.**—Local use of ephedrine sulphate has been found of service in conditions attended with **congestion of the nasal mucous membrane**, a long-sustained ischemia of the tissues resulting (nearly 3 hours, according to Fetterolf and Sponsler). For **irrigation of the nasal sinuses** and maintenance of drainage 0.1 to 0.5 per cent. solutions have been recommended by A. W. Proetz (Ann. of Otol., Rhin. and Laryng., June, 1927). Relief of nasal symptoms in **hay fever** is asserted to have followed internal use of ephedrine. The drug has been used considerably in

**bronchial asthma.** Of 12 cases of asthma associated with chronic bronchitis, treated with it by H. McPhedran (Can. Med. Assoc. Jour., Mar., 1928), 9 were completely relieved of their paroxysms, but 2 could not take the drug, 1 on account of sleeplessness it induced and the other because of profuse sweating. The dose used was ¾ grain (0.05 Gm.). The usual dose for asthmatic children is ⅓ grain (0.025 Gm.). W. S. Thomas (N. Y. State Jour. of Med., Aug. 1, 1927) points out, however, that the optimal dose varies in different individuals, and that failure may be due to incorrect dosage.

Ephedrine has been endorsed for the treatment of **shock, hemorrhage**, and other conditions attended with **low blood-pressure**. R. D. Rudolf and J. D. Graham (Amer. Jour. Med. Sci., Mar., 1927), administering doses of 0.05 to 0.1 Gm. (¾ to 1½ grains) by mouth to 17 patients with subnormal blood-pressure, found that over 80 per cent. showed a rise of pressure exceeding 20 mm. Hg and lasting nearly always 2 hours and sometimes 3 or 4 hours. The diastolic pressure was not affected to any extent. Intravenous use of ephedrine was shown by these writers to be very useful in preventing or combating the fall of blood-pressure which sometimes attends **spinal anesthesia**. In 26 such cases, 0.05 to 0.1 Gm. given intravenously at the time when the blood-pressure had apparently reached its lowest level caused an average rise of pressure of 68 mm. Hg and kept the pressure slightly above normal for 1 to 1½ hours. In 4 patients given ephedrine subcutaneously the average rise of pressure was 41 mm. In a patient with **surgical shock**, dying of peritonitis, with the radial pulse impalpable, 0.1 Gm. of ephedrine intravenously yielded a systolic pressure of 86 mm. within 2 minutes, and the good effect lasted 45 minutes. It should be noted that according to some other authors ephedrine is relatively ineffective in overcoming severe grades of circulatory depression.

The favorable effects from adrenalin in **specific hypersensitiveness** have led to the use of ephedrine in various conditions of this type. Aside from asthma and hay-fever, good results have been reported in **serum sickness, urticaria**, and **angioneu-**

**rotic edema.** In a case of the latter disorder observed by McPhedran, relief from swelling and itching for 5 hours could be obtained with a  $\frac{3}{4}$ -grain (0.05-Gm.) dose.

According to E. L. Ross (Arch. of Otolaryng., June, 1927), ephedrine and cocaine do not act synergistically on the blood-pressure like epinephrine and cocaine. Ephedrine does not increase, but decreases the toxicity of cocaine.

**PHENYLAMINOETHANOL SULPHATE.**—This is synthetic substitute for ephedrine, studied by H. Miller and G. Piness (Jour. Amer. Med. Assoc., Oct. 8, 1928). The desirability of such a substitute has arisen through the scarcity of natural ephedrine and the considerable difficulty and expense of synthesizing it. The compound is chemically a racemic  $\alpha$ -phenyl- $\beta$ -amino-ethanol sulphate of the formula  $(C_6H_5.CHOH.CH_2NH_2)_2.H_2SO_4$ . The writers concluded, from clinical tests, that the field of greatest utility of the new drug is as a topical application in the nose, in which its activity is in every way comparable to that of ephedrine. A 2 per cent. solution of the drug was equivalent to 3 per cent. ephedrine. Used by dropper, spray, applicator or nasal pack in 20 cases of **hay fever**, it brought relief in 3 to 5 minutes, without irritation. The mucosa remained shrunken and the patients were more or less symptom-free for 1 to 24 hours. The mydriatic effect of the drug was comparable to that of ephedrine. Its hypertensive effect, however, was much less, but was unattended with mydriasis, local pain or reaction, or any other untoward symptoms. In bronchial asthma the drug's action proved disappointing.

**EPIDIDYMITIS.**—In *acute gonorrheal epididymitis*, Stone (Jour. of Urol., Aug., 1928) advocates **epididymotomy**, which, he finds, gives immediate relief of pain in a large minority of cases and earlier relief than any other treatment in a large majority of cases. It shortens the time of incapacity by  $\frac{1}{2}$  as compared with expectant treatment and has a lower percentage of recurrences than any other form of care save **mercuro-**

**chrome**, which is only slightly superior to it. In selected cases **diathermy** may obviate any incapacitation, but it does not have much effect on pain, and gives the poorest results as regards time of involution.

In 24 cases of gonorrheal complications, particularly epididymitis, Scharman (Wien. klin. Woch., Nov. 3, 1927) resorted to **autohemotherapy** with success. Blood from the patient's ulnar vein was injected directly into intramuscular tissue in amounts gradually increasing from 3 to 7 c.c. Generally after 4 injections on alternate days the patient could be discharged.

#### EPILEPSY.—ETIOLOGY.—

Various opinions on this question continue to be expressed. Popea and Eustaziou (Presse méd., May 21, 1927), observing in 16 cases that amyl nitrite inhalations arrested the convulsive seizures, or averted them when administered as soon as the earliest signs appeared, endorse the view that *vasoconstriction*, i.e., the sympathetic system, plays a determining rôle in the pathogenesis of epileptic attacks.

According to G. W. Swift (Northw. Med., June, 1928), epilepsy may be due to mechanical factors as the result of *defect or arrested development of the occipital bone*, causing decreased capacity of the posterior cerebral fossa. The peculiar anatomy of the sigmoid sinuses results in pressure against the sinus walls as the brain develops. The back pressure in the sigmoid sinuses is not sufficient to cause hydrocephalus but sufficient to impede venous blood flow in the sinuses, including that in the longitudinal and straight sinuses. As

ultimate results there are lake formation in the arachnoid, dilatation of the veins of the cerebral cortex and of the ventricles, congestion of the cortical arterial capillaries, and eventually pressure atrophy of the cortex. The writer's pathologic studies supported this theory. Exciting factors of epilepsy include the variations in brain function at critical periods of life, *viz.*, birth, ossification of the cranial bones, puberty, pregnancy, menopause, as well as such variations as may occur at any time from brain congestion due to trauma, alcohol, acute febrile conditions, arteriosclerosis and other degenerative changes. The cerebrospinal fluid plays an important part in the development of increased intracranial pressure, and the epileptic threshold may be considered as that point in the ratio between the inflow and outflow of this fluid, above which the brain cannot function. The writer advocates operative relief by an **occipital basilar resection** and **decompression** along the lateral sinuses. This operation is readily performed, is practically free from mortality, and in early cases apparently accomplishes the desired end.

C. A. Elsberg and F. H. Pike (Amer. Jour. of Physiol., May 1, 1926) similarly hold, from animal experiments, that variations in *intracranial pressure* have a decided bearing on the susceptibility to convulsive seizures. The benefit from starvation in some cases of epilepsy may be partly due to decreased intracranial pressure through diminution of fluid intake. Unilateral seizures—Jacksonian epilepsy—may be due to a considerable degree to localized variations in intracranial pressure. Kroiss

and Dielmann (Münch med. Woch., June 10, 1927) found positive pressure of the cerebrospinal fluid in each of 7 epileptics in whom they performed puncture of the cisterna magna.

*Protein sensitization* in epilepsy has been investigated by J. F. Ward and H. A. Patterson (Arch. of Neur. and Psych., Apr., 1927), who found 37 and 56.8 per cent. of such sensitization in 2 large institutional groups of epileptics, as against 8 per cent. in a non-epileptic control group of 100 subjects. R. H. Spangler (Jour. of Lab. and Clin. Med., Oct., 1927), among 100 epileptic adults, found in 88 per cent. a history of allergy in the ancestors. Gastro-intestinal allergy, as shown by using substitutes for mother's milk, appears to be an important factor in the development of convulsions in the allergic child. Of the 100 epileptics, 32 had convulsions in infancy, of whom 24 were bottle fed and 8 breast fed. Food history, *i.e.*, tabulation of all articles of food ingested, to determine and eliminate the sensitizing agent, is of more clinical value in allergic epilepsy than food skin tests. When the causative agent cannot be determined in epileptics with an hereditary or personal history of allergy and in whom a leukocytosis occurs following a convulsion, **non-specific desensitization** by **venom protein (crotalin)** solution, when regulated by the percentage of eosinophile cells, has proved of value in decreasing the state of allergy.

Examining various *endocrin organs*, including the genital glands of 6 cases and the liver of 1 case, in epilepsy, Shou and Susman (Brain, Mar., 1927) found significant lesions, such as perivascular necrosis, in nearly all. The liver, islets of Lan-



gerhans, pituitary and adrenals all showed lesions, as did also the acinar tissue of the pancreas. The pathologic agent has a selective action on chromophile cells, as seen in the adrenals and pituitaries. In severe cases a toxic perivascular necrosis is present in all the organs examined.

According to P. Hartenberg (*Presse méd.*, May 19, 1926), *habit* is an important factor in repeated epileptic attacks. The acquisition of habits is 1 of the fundamental functions of the brain. The epileptic convulsions are the consequence of inhibition of the functioning of the cortex, from various lesions, including defective development. The habit starts with the 1st seizure, and successive attacks gradually lower the seizure threshold. There is an imperative need of breaking up the habit by any and all means at the outset.

In *traumatic epilepsy*, in order to elicit symptoms pointing correctly to the site of the lesion, Heidrich (*Beitr. z. klin. Chir.*, cxxxvi, 341, 1926) has frequently found useful the procedure of hyperventilation. The patient, recumbent or sitting, breathes intensively for 10 to 15 minutes and as a result, develops an attack, which yields the desired information.

**TREATMENT.**—Chief interest in this connection has centered of late about the **ketogenic diet** for epilepsy in childhood. As described by M. G. Peterman (*Jour. Amer. Med. Assoc.*, June 11, 1927), the most striking and effective treatment of epilepsy is starvation; but this, of course, can only be temporary. The ketogenic diet aims to reproduce the ketosis and tendency to acidosis of starvation. The diet is a low-carbohydrate, low-protein and high-fat ration adjusted

for the individual patient. It is preceded by 1 week or longer of starvation, until the attacks cease. During this period the patient is kept in bed and may be given water, clear broth, and bran wafers freely; 6 to 8 ounces of orange juice is allowed daily. The requirements for the ketogenic diet may be simply calculated at 30 calories per pound, with the total not exceeding 1800 or 2000 calories. Further adjustment is made to keep the weight at or slightly below normal for the patient's age and height. Children under 5 years are given daily 20 Gm. of carbohydrate and 1 Gm. of protein per kilo. ( $2\frac{1}{2}$  lbs.) of body weight, with the remaining calories supplied in fat. Those over 5 years receive 15 to 20 Gm. of carbohydrate,  $\frac{2}{3}$  Gm. of protein, and the rest in fat. The vitamins and mineral salts must be supplied. Any tendency to nausea or emesis is quickly controlled with orange juice.

When diacetic acid appears in the urine the attacks usually cease or are greatly reduced. If convulsions continue, the carbohydrate may be reduced to 10 Gm. and the fat pushed to the limit of tolerance. When the attacks are under control, the diet is continued for 3 months even through all ordinary illnesses. If there are no further attacks the carbohydrate is increased by 10 Gm. monthly up to 50 Gm. Then the fat may be reduced 15 or 20 Gm. During the next 6 months the carbohydrate may be increased 10 Gm. in alternate months, and the protein 5 Gm., alternating with the carbohydrate. As the high-fat diet nearly always produces constipation, **liquid petrolatum** and **agar** preparations are given to insure a daily movement. Careful restriction

of the proteins for the 1st year is essential if best results from the treatment are to be obtained.

F. B. Talbot, K. M. Metcalf and M. E. Moriarty (Boston Med. and Surg. Jour., Jan. 20, 1927), in calculating the **ketogenic diet** for a given case, substitute the grams of food constituents directly in the formula rather than their ketogenic and anti-ketogenic components. Thus, for a girl of 12 years, having an expected weight of 40 kilos., the total basal requirements for this weight (Benedict and Talbot tables) plus 50 per cent. additional (for exercise, growth and loss in excreta) = 1850 calories. The protein requirement, P, being 1 Gm. per kilo., = 40 Gm. Beginning with a 1.5:1 ketogenic (fat)-anti-ketogenic (carbohydrate and protein) ratio, we have:

$$(1) 1.5:1 = F:C + P.$$

$$(2) F(\text{fat}) = 1.5 (C + 40).$$

Inserting the caloric value per gram of each of the food constituents:

$$(3) 1850 = 9F + 4C + 4P.$$

Substituting now the value of F from (2) and the known value of P:

$$(4) 1850 = 9[1.5(C + 40)] + 4C + 160.$$

Whence, C(carbohydrate)=66 Gm. and F = 159 Gm.

The increasing ketogenic diets on 2:1, 3:1, or 3.5:1 ratios are derived in like manner.

After several days to a week of the initial 1.5:1 diet, diets with increasingly ketogenic ratios are instituted. In some cases there may be a great reduction or even cessation of attacks during the 1st week of the 2:1 diet. The marked ketonuria coinciding with definite improvement of epileptic symptoms was not attained, however, in the majority of the writers' cases

until a 3:1 diet was established. They agree with Helmholtz that a symptomatic cure is obtainable by the ketogenic diet in at least  $\frac{1}{3}$  of the cases, with great improvement in many more. A marked ketosis may be maintained over a long period without any untoward symptoms, even during mild infections. In fact, the patients seem to be improved both mentally and physically.

Attention is called by I. McQuarrie and H. M. Keith (Amer. Jour. Dis. of Childr., Dec., 1927) to a pronounced diurnal variation in the excretion of acetone bodies in children taking the **antiketogenic diet**. The excretion reaches a high peak in the afternoon and a low level in the morning hours (3 to 9.30 A.M.). Convulsions may occur during this latter period, and in a few cases it may be desirable to give a midnight meal to prevent the morning decrease in ketosis. These observers, in children up to 5 years, allow 1.25 Gm. of protein and 0.75 Gm. of carbohydrate per kilo.; between 5 and 10 years, 1 Gm. and 0.5 Gm., and above 10 years, 1 Gm. and 0.25 Gm., with the remaining caloric requirement made up from fat. The total requirement is calculated in the same manner as by Talbot *et al.* With these allowances the ketogenic-antiketogenic ratio is always above 3.2:1, insuring ketosis of a fairly marked grade. Such a diet is taken immediately without objection, when preceded by a fasting period of 2 or 3 days.

According to W. G. Lennox (New Eng. Jour. of Med., July 12, 1928), the benefit from the **ketogenic diet** is not due to correction of an underlying abnormality of acid-base equilibrium in epileptics, but to decreased nervous irritability. Acidosis relieves condi-

tions other than epilepsy, such as muscular cramp, hiccough and tetany. The benefit from ketosis seems due to the acidosis rather than to a sedative effect of diacetic acid, since seizures may be reduced also by other methods of inducing acidosis, such as the ingestion of acid or acid-forming salts (ammonium chloride or nitrate) or by breathing a mixture high in CO<sub>2</sub>. Patients on a ketogenic diet, if given bicarbonate, will show an increase in the ketone bodies, often with a coincident increase in seizures. Overventilation may likewise induce seizures. In the writer's experience, patients with traumatic epilepsy may be helped by induction of acidosis. As for the degree of ketosis needed to prevent seizures, this depends upon the severity of the case. In mild cases, the presence of a positive ferric chloride or sodium nitroprusside test in the urine may be sufficient. In severe cases, a change in the pH of the blood may be necessary. Ketosis is more readily maintained in children than in adults.

The results obtained with **phenobarbital-sodium** (luminal-sodium) in patients in an epileptic colony in whom other methods of treatment failed are recorded by J. T. Fox (Lancet, Sept. 17, 1927). The dosage ranged from 1 to 3 grains (0.06 to 0.2 Gm.), given once in the 24 hours, either morning or evening. Most patients had 2 grains (0.13 Gm.) a day. Phenobarbital-sodium is generally said to be less effective than phenobarbital itself in epilepsy. Out of 167 cases, 30 per cent. showed benefit likely to be permanent; 31 per cent., after being benefited for over 3 months, apparently became tolerant to the drug; in 33 per cent. the fits were unaltered or decreased for less than 3 months, and in 6 per cent. there was an increase of fits. Nine cases in the 1st group had their fits

completely arrested for 2 years or longer. The best results are to be expected in early life. Stopping the drug was almost always followed by an increase of fits, the incidence often being higher than before it was started. Rashes were observed in only 2 cases. Grave mental disturbances following the use of the drug were rare, and ascribed to the abrupt cessation of attacks rather than to the drug itself. It should not be prescribed unless there can be careful supervision of the patient's behavior as well as an accurate record of the fits occurring. The drug was sometimes given in isolated doses up to 5 grains (0.3 Gm.) after the 1st seizure to patients who usually had many fits in succession; this measure was very often successful in preventing further fits.

According to H. A. Patterson, L. A. Damon and P. Levi (Jour. of Nerv. and Ment. Dis., May, 1926), no tolerance is developed for **phenobarbital**, whether used orally, subcutaneously, intravenously, or intraspinally. No ill-effects follow its use in therapeutic doses. The time required for effects is: Orally, 1 to 2 hours; subcutaneously, 15 to 30 minutes; intravenously, almost immediate action; intraspinally, ½ hour or more. The subcutaneous method is preferable in serial seizures; the intravenous is indicated in status epilepticus. Intraspinial injection may subsequently render refractory cases more amenable to other types of treatment.

P. Marie (Presse méd., Jan. 21, 1928) combines **phenobarbital** with **potassium borotartrate**. He begins the treatment in children with the latter drug, and if the attacks are unaffected or increase, adds the pheno-

barbital. In adults both drugs are given from the start. The borotartrate is prescribed in glass tubes each containing 3 Gm. (45 grains). One tube is used daily, dissolved in about 125 c.c. (4 ounces) of water,  $\frac{1}{3}$  of this solution being taken before each meal. Where phenobarbital is also used, 0.1 Gm. ( $1\frac{1}{2}$  grains) of it every other day is sufficient, unless the attacks continue frequent, when this dose is given daily. It should be taken daily for 3 days before and after the menstrual period, as well as throughout the period. The drug is taken  $\frac{1}{2}$  hour before retiring, with some hot fluid. The writer recognizes lesions of the sense organs or pleuropulmonary or cardiac lesions as among the causes of epilepsy in adults, and in children lays stress on birth injury.

Comparing in 9 cases the effects of potassium borotartrate [COOH-CHOH.CHO.BO.COOK] alone, 1 Gm. (15 grains) 3 times daily for 1 month, with those from phenobarbital, 0.1 Gm. ( $1\frac{1}{2}$  grains) twice daily for a like period, W. G. Lennox and L. H. Wright (Boston Med. and Surg. Jour., Dec. 23, 1926) found the latter drug the more effective. The borotartrate may be supposed to act by promoting acidosis.

In 3 out of 5 cases Madsen (Acta med. Scandin., Aug. 31, 1927) witnessed a pronounced reduction of attacks and mental improvement under Collip's **parathyroid extract**, combined sometimes with **calcium** treatment. Klein and Forcione (Jour. of Nerv. and Ment. Dis., Apr., 1927) saw no benefit from **calcium** in various types of epilepsy, noting, however, that injections of calcium salts failed to cause a sustained increase of blood calcium. Laignel-Lavastine (Monde méd., Dec. 1-15, 1926) states that cal-

**cium chloride** is indicated where the urine shows a low hydrogen ion concentration; in refractory cases combining this drug with **phenobarbital** has sometimes proven successful where the latter agent alone failed.

In a case studied by Freudenberg (Zeit. f. Kind., Apr. 13, 1926), seizures did not occur when the sodium chloride in the blood serum was below 0.5 per cent. The therapeutic object was therefore sought of keeping the blood chloride low all the time by giving daily 9 Gm. (135 grains) of **sodium bicarbonate** and 1 Gm. (15 grains) of **potassium bicarbonate**.

A **brain emulsion** was given subcutaneously in the dose of 1 c.c. (16 minims) daily in alternate months in 69 cases of refractory epilepsy by Militzyn (Russk. Klin., Mar., 1926). In most cases the seizures were reduced and the general physical and especially the mental condition improved. In 9 cases R. Novoa Santos (Arch. de med., cir. y esp., Oct. 1, 1927) gave 10 intravenous injections of 2 c.c. of **brain emulsion** in 20 per cent. **soluble barbital** solution, with asserted good results.

Kafka (Fortschr. d. Med., Feb. 18, 1927) deems individualization of treatment an important prerequisite to successful results. In a girl of 17 with obesity of ovarian origin, epileptic convulsions at the menstrual periods, and Abderhalden tests showing ovary, 2, and pituitary, 1, vigorous treatment with **ovarian substance** and small doses of **pituitary** resulted in permanent cessation of the seizures. In an epileptic young man of 19, with rapid pulse, thyroid enlargement, dilated pupils, and Abderhalden tests showing thyroid, 2, and cerebral cortex, 1, thyroid treatment made the



seizures worse, but **sodium phosphate**, directed at the nervous factor in the case, in conjunction with **phenobarbital**, led to their cessation for 1 year. In some cases in which organotherapy failed the writer had much success in dispelling the convulsive proclivity of the brain by intravenous use of **strontium salts**, especially such as contain bromine. In cases with conspicuous endocrin symptoms, suitable organotherapy may dispel the seizures without the use of sedatives such as phenobarbital. In patients with combined thyroid disturbance and sympathetic irritation, giving  $7\frac{1}{2}$  grains (0.5 Gm.) of **sodium phosphate** 3 or 4 times daily permits of cutting down or omitting phenobarbital.

According to L. P. Clark (Med. Jour. and Rec., Aug. 18, 1926), the greatest and surest permanent benefits in epilepsy are obtained when sedation is held to the minimum and **supportive** and **restorative remedies** are mainly employed.

F. Driak (Wien. klin. Woch., Oct. 13, 1927) states that 2 cases in which **suprarenalectomy** was performed were still free of seizures  $1\frac{1}{2}$  to 3 years later.

In 1 case in which **periarterial sympathectomy** was carried out, there were no attacks for 3 months.

**EPISTAXIS.**—According to Wigger (Brit. Med. Jour., Sept. 24, 1927), epistaxis, irrespective of its cause, is quickly controlled by a hypodermic injection of  $\frac{1}{2}$  grain (0.03 Gm.) of **morphine**.

In stubborn nosebleed, threatening life, Popp (Wien. klin. Woch., Aug. 11, 1927) secured a prompt and permanent hemostatic effect by **X-ray stimulation of the spleen**.

**ERGOT.**—*Ergotamine*, a crystallized alkaloid isolated from ergot by Stoll in 1918, and having the empiric formula  $C_{33}H_{35}N_5O_5$ , is stated by A. M. Hellman (Med. Jour. and Rec., Jan. 19, 1927) to be the most reliable and valuable ergot preparation he has ever used. Its action on the uterus is powerful and lasting. It is better than whole ergot for hypodermic use, causing absolutely no pain, and is also better by the mouth, being practically tasteless and avoiding the gastric distress often noted after fluidextracts of ergot. In commerce ergotamine is obtainable in the stable form of the tartaric acid salt in tablets of 0.001 Gm. ( $\frac{1}{65}$  grain) and ampules of 0.0005 Gm. ( $\frac{1}{130}$  grain). The writer used it successfully in doses of  $\frac{1}{2}$  to 1 ampule hypodermically and in the tablets by mouth, 1 to 2 tablets 3 times a day. As with all forms of ergot, it is contraindicated intrapartum except when given directly prior to the incision for a **Cesarean section**. **Menorrhagia** and **metrorrhagia**, whether endocrin, "functional," or due to fibroids, are helped more promptly than with the usual ergot preparations. It is efficient in **incomplete abortion** and after **curettage**, facilitating the latter procedure by rendering the uterus hard. In **subinvolution** and prolonged slight bleedings after delivery it can be depended upon to a greater degree than ordinary ergot. Hypodermically, the drug acts in 5 to 8 minutes; it is well, ordinarily, to wait at least 20 minutes before repeating the dose.

**ERYSIPELAS.—PROPHYLAXIS.**—Active immunization against erysipelas by the use of the toxin from *Streptococcus erysipelatis* has been shown feasible by K. Birkhaug (Jour. Amer. Med. Assoc., Mar. 19, 1927). The toxin used has a concentration of between 5000 and 10,000 skin test doses per cubic centimeter. The active immunity conferred on a patient by an attack of erysipelas generally disappears in about 6 weeks. A negative skin test will then again become positive, and the patient is subject to a recurrence of the condi-

tion. The writer succeeded in producing a rapidly increasing concentration of antitoxin in the patient's blood through biweekly intramuscular injections of 500, 5000 and 50,000 skin test doses of extracellular and intracellular toxin produced by *S. erysipelatis*, thus tending to prevent recurrence of the disease.

**TREATMENT.**—Birkhaug (*ibid.*, May 8, 1926) announced the preparation of an **erysipelas antistreptococcic serum** which, in doses of 15 to 20 c.c., gave very favorable results in 60 moderately severe cases. Given early, this serum caused a critical fall of temperature and fading of the local lesion. In late cases, several injections were required. The serum is prepared like antitoxin for diphtheria and scarlet fever.

The effects of Birkhaug's serum in 30 cases were compared by E. S. Platou, F. W. Schlutz and L. Collins (Amer. Jour. Dis. of Childr., Dec., 1927) with those of **X-ray** treatment in 80 cases and of **magnesium sulphate and glycerin packs** in 35 control cases. The inadequacy of a single dose of serum for adults was soon apparent, and the writers advocate 1 to 4 doses intramuscularly, depending on the age, extent, severity and duration of the disease. In using the X-ray, a mild erythema dose was applied over the face and the lateral surfaces of the head and neck, with the scalp treated in addition only when threatened or actually invaded. Elsewhere in the body, a large border of normal skin around the affected area was always irradiated. The 3 groups of cases, in the order above given, showed an average time from treatment to disappearance of symptoms of 3.8, 2 and 8 days, respectively;

appreciable extension of the disease in 46, 21 and 68 per cent.; mortality, 6, 6 and 23 per cent. In 10 grave cases, antitoxin and X-ray were then used in combination, with gratifying results. The best treatment for erysipelas now available probably includes the intravenous, intraperitoneal or intramuscular use of erysipelas antitoxin in adequate dosage, together with a proper (large) X-ray irradiation of the involved area and contiguous normal skin.

Using a concentrated **erysipelas antitoxin** each cubic centimeter of which contained more than 50,000 neutralizing skin test doses, J. F. Anderson and G. F. Leonard (Jour. of Lab. and Clin. Med., Oct., 1927) observed a prompt improvement in the patient's toxic depression, followed by a rapid drop in temperature, pulse and respiration, sometimes within 12 to 18 hours. Early adequate doses caused rapid fading of the lesions and absorption of the blebs and pitting edema in previously affected parts. Late treatment caused the same distinct amelioration of toxic depression, but the temperature and pulse usually declined by lysis. The dose of antitoxin used in 32 cases ranged from 10 to 36 c.c.; average, 20 c.c. The average period between antitoxin injection and discharge was 6 days. Serum sickness developed in about 20 per cent. of the cases.

A **stock vaccine** including several strains of pyogenic and erysipelas streptococci was injected intravenously or intramuscularly in 15 cases in children by M. Giuffrè (Pediatr., Sept. 1, 1927). The injections were generally given on alternate days. General and local reactions occurred. There was usually striking improvement from the start of treatment.

The **X-ray treatment** of erysipelas is lauded by J. E. Harbinson and J. D. Lawson (Cal. and West. Med., Apr., 1927). Usually relief follows within 24 hours. The febrile period and total illness are shortened, and there seem to be fewer complications and less chance of extension of the disease than with other treatments. Advanced, serious cases involving fairly large areas, with high temperature and general infection, may be successfully treated.

The **ultra-violet rays** in 1.5 erythema dosage are recommended in erysipelas by J. Becker (Münch. med. Woch., Mar. 25, 1927). The rays should be directed not only to the affected area but also to a zone 4 centimeters ( $1\frac{3}{8}$  inches) wide around it.

Along with **camphorated ether** locally, E. Foster and Arancibia (Semana méd., Oct. 6, 1927) used the **ultra-violet rays** and an atoxic **vaccine** in 4 cases of severe erysipelas in infants, recovery resulting in 6 to 11 days.

The extreme variation in mortality from erysipelas in the different age groups is emphasized by A. J. Schaffer and P. E. Rothman (Amer. Jour. Dis. of Childr., Jan., 1927). Between 5 and 50 years the mortality is less than 4 per cent., while the curve rises rapidly in both infancy and old age, the average before 5 years being 11.5 per cent., and after 70 years, 25 per cent. (C. B. Ker). Among 17 infants 1 to 6 months old the mortality was 53 per cent. The writers treated 19 *children up to 2 years of age* by **transfusion of whole citrated blood** (about 10 c.c. per pound), where necessary repeating the procedure once or twice with blood from different donors. The mortality was distinctly lower in

the treated than in the control group, only 22.5 per cent. of 13 cases in infants aged 1 to 12 months who received transfusion dying, as against 50.3 per cent. of 38 infants of the same age group not receiving transfusion. That the benefit is due to non-specific protein shock was shown to be unlikely by certain observations in the writers' cases. They ascribe it to the relative immunity to *S. erysipelatis* possessed by the blood after the 1st few years of life, such immunity being transferred to the infant-patients by the adult donors. The fact that a certain small percentage of adults die of erysipelas should explain why adult serum from all donors is not equally efficacious.

**ESOPHAGUS.—CANCER.—**  
**DIAGNOSIS.**—Chevalier Jackson (Amer. Jour. Med. Sci., May, 1925) states that there are only 2 means by which an early diagnosis of this condition can be made, *viz.*, the Roentgen-ray and esophagoscopy. Only by these means will the diagnosis ever be made early enough to give the surgeon a chance to develop the technic of a curative operation; only by these means can efficient palliation be started in time to prolong the patient's life. All other means are *always negative in the early stages*. Dysphagia, odynphagia, pain, weight loss, hematemesis and emaciation are all hopelessly late symptoms, so far as any attempt at cure is concerned. The early symptoms are variously described as a slight, queer feeling in swallowing; a feeling of nervousness about starting to swallow; a feeling of nervousness in the neck; a feeling of cramp around the neck; food sticking in the throat while eating in a

hurry; a feeling as of a lump rising in the throat. Cough is sometimes an early symptom. In early diagnosis, X-ray examination should always precede the esophagoscopy. Fluoroscopy reveals the function of the esophagus and excludes aneurism, while ray films reveal the lateral extent of the growth. No importance should be attached to negative ray findings except those of experts with the best apparatus. There is no way of distinguishing between the globus of hysteria and that of organic disease other than by the esophagoscope. The bougie as a diagnostic means is dangerous, inconclusive, and always hopelessly late.

**TREATMENT.**—Jackson (*loc. cit.*) agrees with W. Meyer that the common squamous-celled endesophageal carcinoma is the most benign of all carcinomas of the gastrointestinal tract, growing slowly, having little tendency to metastasize, and not being very apt to recur. Excellent fundamental work in **resection** of the esophagus has been done by a number of surgeons, but the lacking essential is early diagnosis, which could be furnished by esophagoscopy. The most important palliative measure is very early **gastrostomy**, to stop irritation of the tumor by food and oral secretions. Inoperable cases live longest under early gastrostomy; a varied, well-balanced **diet** by tube, plenty of **water** by the mouth, and **radiation**. With proper water and food supply most cases will live at least 2 years from the onset of the disease, and some have survived 5 or 6 years.

Good results from **radiation** in 3 inoperable cases with rapidly progressing cachexia are reported by

Coryllos and Kaplan (Amer. Jour. of Roentg. and Radium, Ther., Oct., 1927). As soon as the diagnosis is made a **gastrostomy** is performed and the patient fed a properly balanced feeding of at least 2500 calories daily through the gastrostomy tube. As soon as the artificial feeding plan is working effectively, radiation therapy is begun. High-voltage **X-rays** are applied externally to the local lesion, and there are inserted directly into the tumor mass, through the esophagoscope, specially prepared removable platinum-filtered **seeds of radon** (radium emanation). F. R. Herri-man (Laryngoscope, Sept., 1927) likewise reports gratifying results from implantation of platinum **radon seeds** in inoperable cases. The screened containers eliminate all danger of necrosis.

**Diathermy** is applicable in esophageal malignancy without undue risk and with alleviation of symptoms, according to A. J. Wright and G. Hadfield (Brit. Jour. of Surg., July, 1927).

**DIVERTICULUM.**—F. H. Lahey (Boston Med. and Surg. Jour., Mar. 3, 1927), reporting 8 cases of esophageal *pulsion diverticula* operated without mortality, states that the 2-stage procedure and local anesthesia render **removal** of such diverticula so safe that they should not be permitted either to attain large size or to produce obstruction symptoms before operation is sought.

**FISTULA.**—The utility of *Vinson's sign* in demonstrating the presence of a *tracheo-esophageal fistula* in cancer of the esophagus is emphasized by Myerson (Arch. of Otolaryng., May, 1926). In the writer's case the fistula was demonstrable only in this way.



Vinson noted that, in cases of carcinoma of the esophagus which have perforated into the trachea or the bronchus, a swallowed thread would find its way through the fistula and keep twisting itself around the tracheo-esophageal wall by successively passing through the esophagus after emerging from the larynx.

**FOREIGN BODY.**—A new diagnostic sign of foreign body in the *cervical esophagus*, where most esophageal foreign bodies lodge, is described by G. Tucker (Jour. Amer. Med. Assoc., Feb. 14, 1925). Moving the trachea or the larynx toward the point of localized tenderness, as indicated by the patient, by pressure from the opposite side of the neck, causes a marked increase in tenderness and pain at this point while the foreign body is present. If the foreign body has passed on or has been removed, there will be little or no change in tenderness by pressure from the opposite side. This sign is particularly useful in cases of fish-bone, splinters of wood and similar foreign bodies that are not only non-radiopaque, but which, being slender, permit a capsule to pass by either with or without the assistance of a swallow or two of water.

A simple procedure for facilitating *X-ray examination* of the esophagus with a contrast material is described by Schereschewsky (Deut. med. Woch., Jan. 14, 1927). An inspiration made just when the contrast material reaches the cardia stops its further progress. This affords the observer more time to examine this portion of the esophagus.

**ETHER.**—The *cardiac output* under ether anesthesia was studied in dogs by Blalock (Arch. of Surg., Mar. 1927), using the Fick method. He observed an increase of

output averaging 76 per cent. The output falls below normal only when the anesthesia is profound. The increased output is not associated with increased oxygen consumption but with a diminution in the oxygen coefficient of utilization. This change is associated with an increase in the hydrogen ion concentration of the blood and a decrease in the carbon dioxide content, and may or may not be accompanied by a diminution in the percentage saturation of the arterial blood.

**THERAPEUTICS.**—Injection of 20 c.c. (5 drams) of ether into the uterus gave good results in 10 cases of **endocervicitis** thus treated by De Tarnowsky (Surg., Gyn. and Obst., Nov., 1927). The treatments are given in the office, twice a week. In 3 cases, 1 dram (3.75 c.c.) of ether was injected to produce a **therapeutic abortion**.

Small oil-ether enemas are of service in severe colicky disorders, such as **gall-stone colic**, according to L. Ymaz (Prensa méd. Argent., Nov. 20, 1927). The formula comprises: Ether, 6 c.c. (1½ drams); olive oil, 60 c.c. (2 ounces), and tincture of opium, 10 drops. From 5 to 10 c.c. (80 to 160 minims) can be used in 24 hours.

**ETHYLENE.**—According to C. L. Hewer (Brit. Jour. of Anesth., Apr., 1926), the chief value of ethylene-oxygen anesthesia is for operations of medium severity lasting for a considerable time. In an average case, it permits of a rapid and pleasant induction; moderate relaxation without cyanosis, and a quick recovery, with few, if any, after-effects. For short minor proceedings, ethylene offers no advantages over nitrous oxide and, indeed, is more likely to give rise to nausea or vomiting. Again, for extensive laparotomies, etc., in which absolute muscular relaxation and minimal respiratory movements are essential, ethylene cannot compare with the endotracheal nitrous oxide-oxygen-ether technic. A further use of ethylene-oxygen is as an adjuvant to regional analgesia, *e.g.*, in cases of gastrectomy performed under paravertebral or splanchnic block. It is undoubtedly preferable to pure nitrous oxide-oxygen in these combined methods, as respiration will be shallow and all cyanosis avoided without the disadvantage of any added ether.

H. Cabot and H. K. Ransom (Ann. of Surg., Aug. 1927) state that ethylene has all the advantages of nitrous oxide-oxygen and also gives greater relaxation and avoids objectionable cyanosis. In their practice it has practically pushed nitrous

oxide from the field. Its use calls for trained anesthetists and a rather cumbersome apparatus. It is not likely, therefore, to supersede ether or chloroform for use outside hospitals, but for general hospital practice it has outstanding advantages.

## F

**FRACTURES.**—The *non-union* of fractures has been discussed for many years, with virtually no satisfactory results until the ductless glands were taken into account. At first, the preparations available, notably desiccated thyroid, were of mediocre quality and were given in excessive doses, with results unsatisfactory in many instances. In recent years, however, the superior preparations available have shown their true worth. Some years ago, Kolodny, in a series of experimental studies (Surg., Gyn. and Obst., June, 1924) of various glands in experimental fractures in animals, to ascertain what rôle, if any, the frequent endocrin disturbances play in the healing of fractures, showed clearly that normal **testicular secretion** is essential for regeneration of bone in animals which have not yet reached maturity, while it is of no demonstrable importance for regeneration of bone in adult dogs. The experiments on the pancreas showed that partial pancreatectomy produced malnutrition in the animals and led indirectly to non-union of fractures. In all the thyroidectomized dogs the parathyroids were left intact in the body, as was proved at necropsy.

As to the influence of the thyroid and **parathyroids**, Ogawa-Keijo (Münch. med. Woch., Nov. 20, 1925) states that it is now generally deemed

doubtful whether the removal of the thyroid alone (leaving the parathyroids intact) lessens or inhibits the deposition of lime. In some of the experiments on record, a part of the parathyroids probably was removed during the operation, and therefore a delayed union or any diminution in the deposition of lime salts was due to the parathyroid deficiency rather than to the thyroid deficiency. In experiments in rats the author found it possible to remove the thyroid from these animals without injuring the parathyroids, the latter being somewhat separated from the upper poles of the thyroid gland. He removed the parathyroids in some animals and the thyroid glands in others, studying the influence of the operation upon the healing of fractures and then investigating the results of thyroid and of parathyroid feeding. The outcome was to the effect that the *parathyroids hasten and favor the deposition of calcium, while the thyroid hormones inhibit it.*

G. H. French (Endocrinol., Jan.-Feb., 1927) observed 2 cases of fractured bones in elderly people, 1 of them being himself, in whom, under ordinary circumstances, union would not have been expected for many weeks. In his own case both bones of the left leg were fractured below the knee joint. A radiogram showed that the fragments were held in place by the quadriceps

tendons. He began taking desiccated **parathyroid substance**,  $\frac{1}{10}$  grain (0.006 Gm.), 3 times a day. At the end of the 6th week, he got up and walked around the room, though his leg was weak. At the end of the 7th week, he walked to the hospital office, his leg in a cast. At the end of the 8th week, he dressed and walked out of the hospital with only a cane for support. From that time on, he used a cane only in going up and down stairs. The parathyroid substance was taken 3 times a day for 7 weeks; then twice a day for 3 weeks; after that, once a day. In another case, that of a lady of 87 years, the patient sustained a compound fracture of the right thigh at the lower third. She was given parathyroid in  $\frac{1}{10}$  grain (0.006 Gm.) doses. Her leg was fixed on an inclined splint for 2 weeks, then in a case with traction weights. She acquired a severe hypostatic pneumonia, which terminated favorably, and at the 4th week had firm bony union. At the 6th week she had excellent functional use of the leg.

An apparently irrational procedure, **periarterial sympathectomy**, for defective consolidation of fractures becomes rational when we realize that an increase of arterial blood to the fractured tissues correspondingly favors the process of repair. Fontaine (*Revue de chir.*, lxiii, 95, 1926) resorted to this procedure in 8 such cases, 2 of delayed consolidation of the radius and 6 of the femur. Sympathectomy of the radial and femoral, respectively, resulted in complete healing with restoration of function in about 6 weeks; in 1, in 10 months. The procedure failed in 3 cases with complicating suppura-

tion or pseudoarthrosis. Experimentally, bilateral fracture of the metatarsus was caused in 2 dogs, and of the tibia in a third. Periarterial sympathectomy was carried out on 1 side. Consolidation occurred much more rapidly on the operated side. Periarterial sympathectomy was also resorted to by Stropeni (*Archiv. ital. di chir.*, June, 1926), who decorticated the femoral artery in 3 cases of fracture which had displayed no tendency to consolidation in 6 months. While the callus did not seem to be increased, it rapidly ossified, and the newly formed bone became normally opaque. He speaks highly of the procedure.

**SKULL.**—Lange (*Berl. klin. Woch.*, July 2, 1926) emphasizes the advantages of **conservative treatment** of non-infected and non-inflamed fractures of the base of the skull. He admits as the only exception a fracture of the mastoid which renders inspection of the drumhead impossible. Inflamed fractures should be treated like any other inflammation of the middle ear. An extensive chiseling is not necessary in all cases.

Krogus (*Acta chir. Scandin.*, lx, 291, 1926) observed a case of fracture of the base of the skull in which air was admitted into the lateral ventricles of the brain as a complication. The original injury was a severe trauma of the forehead. Death occurred on the 3d day after the operation. Post-mortem examination revealed a focus of softening in the base of the frontal lobe, communicating with both lateral ventricles. The anterior parts of these were greatly distended and filled with air and purulent fluid. The author collected from the literature 20 additional cases of intracerebral or extracerebral *pneumatocoele*

and has found records of only 8 cases of pneumatocephalus.

**SPINE.**—R. B. Osgood (Trans. Amer. Med. Assoc., May, 1927) calls attention anew to the frequency, wrong diagnosis, faulty treatment and unnecessary disability attending fractures of the spine. Reviewing 222 such fractures from the clinics of the Massachusetts General and Boston City hospitals, he urges the necessity of most careful roentgenograms in diagnosis, recalling that the symptoms are often slight and misleading. In early cases, patients are usually restored to full wage-earning capacity by adequate **non-operative procedures**, while complications in early cases suggest advisability of **operative procedures**. Late cases may be restored by non-operative methods, but operative methods are more often justified.

Referring to spinal fractures, A. Thomas (Colo. Med., Jan., 1928) favors conservative methods, **operative fixation** of the fractured vertebræ being justified in the cases of body fractures uncomplicated by cord injury. In 100 cases reviewed there were 18 deaths; 14 patients were left with permanent and total disability; 30 with a permanent partial disability averaging 50 per cent.; 26 without any disability, while 12 patients were unaccounted for. Of 34 patients with crush fracture without cord lesion, 19 (55 per cent.) had a permanent disability averaging over 50 per cent. Of 17 in whom the fracture was limited to the transverse processes, 10 (59 per cent.) had a permanent disability averaging 30 to 40 per cent.

**EXTREMITIES.**—J. H. Garlock (Ann. of Surg., Mar., 1928) advocates the following routine treatment

for all traumatic wounds of the extremities:

After the patient is anesthetized, the whole region involved and a wide area of surrounding skin are shaved and carefully and gently **scrubbed** with sterile soft brushes and **tincture of green soap**. The soap suds and débris are washed away with **sterile saline solution**, care being taken to prevent the washings from entering the wound. The limb is then dried with sterile towels and cleansed with **benzine**. A copious **irrigation with ether** then follows. The wound and surrounding skin are next mechanically cleansed by a prolonged **irrigation with sterile saline**. The parts are thoroughly dried and again flooded with ether. The entire area, skin and wound, is then painted with 3.5 per cent. alcoholic solution of **iodine**, care being taken to keep the iodine from the synovial membranes, *e.g.*, in a joint or tendon sheath. The extremity is then draped. Cultures are taken from the depths of the wound and from the surrounding skin and planted so as to demonstrate the presence of anaërobcs. A painstaking débridement of all the traumatized skin and deeper tissues is then carried out. The importance of handling the tissues around such wounds with the greatest care cannot be over-emphasized. The importance of obtaining absolute hemostasis should be realized. The wound and joint are again flooded with ether, and the wound is closed. The skin is **sutured** with interrupted silkworm gut. If skin tension is evident, **releasing incisions** in the skin flaps can be made. Either before or after operation, the patient is given 1500 units of **tetanic antitoxin**.



The period of immobilization in joint injuries varies with each case and depends upon the extent of the injury, the extent of closure of the capsule, and the presence of associated injuries. In general, the earlier active motion is started, the better the end-result.

**CLAVICLE.**—Conwell (Jour. Amer. Med. Assoc., Mar. 17, 1928), on the basis of 92 fractures of the clavicle, recommends a simple fixation dressing. There were 91 simple fractures and 1 compound fracture; 79 were transverse, 3 comminuted, 7 oblique, 3 green-stick, 23 were located in the outer 3d, and 5 in the inner 3d of the clavicle. Nineteen were complicated with injury to the shoulder-joint and 4 with injury to the sternoclavicular joint. Marked overlapping and misplacement of fragments occurred in 39 cases. **Traction** with the arm in a **right-angled abduction splint**, devised by the author, with 90° of external rotation at the shoulder-joint, was used in every moderate or severe injury to the shoulder. Traction was also used in those cases in which marked overlapping and involvement of the sternoclavicular articulation occurred. **Open reductions** for marked overlapping of the fragments were practised in 3 cases, but in no case was this necessary after development of the traction method. Different forms of ambulatory dressings were used, but fewer complications as regards irritation of skin and comfort to the patient and misplacement of fragments were encountered when the author's abduction dressing was applied.

**ARM AND ELBOW.**—N. Allison (Trans. Amer. Med. Assoc., May, 1927) holds that the position of **acute**

**flexion** of the forearm or arm is required for all simple fractures about the elbow, except in fracture of the olecranon and certain complicated comminuted fractures. He deems the right angle elbow splint improper and considers the Lund swathe as the best for general use. The T fracture of the lower end of the humerus, fracture of the olecranon and severe compound comminuted fractures require utmost surgical skill. Volkmann's contracture is the result of interference with the venous return flow of the blood. Nerve paralysis may be primary, the injury occurring at the time of the fracture, or secondary, through pressure due to callous formation. Elbow fractures are potential causes of serious peripheral nerve paralyses. The stiff elbow after elbow injury will require free motion if let alone. Early attempts to reestablish motion in fractures of the humerus may do much to cause development of so-called myositis ossificans. The elbow should never be churned or pump-handled.

In a case of typical *main en griffe* following reduction of a fracture of the medial **epicondyle**, Goldberg (Med. Jour. of Austral., Apr. 23, 1927) used **diathermy**. After 4 weeks of treatment there was complete recovery of both the sensory and motor functions of the ulnar nerve.

**WRIST.**—In an analysis of his results in 342 cases of *Colles's fracture*, Eskelund (Acta chir. Scandin., July 28, 1927) states that the functional result was excellent in 60 per cent., good in 33 per cent., medium in 6 per cent., and bad in 1 per cent. The anatomic result was excellent in 55 per cent., good in 36 per cent., and medium in 9 per cent.

Hathaway (Brit. Med. Jour., July 10, 1926) states that many patients who have suffered Colles's fracture complain, months afterward, far more of weakness of the wrist joint and pain over the ulnar styloid process than of the radial fracture. X-ray examination in these cases shows that this is caused by a *fracture and separation of the ulnar styloid process*. Although the fractured radius may be accurately replaced, yet, if X-ray examination shows this styloid process to be still separated, the writer insists that **open operation** should be performed in order to get good bony union of the fractured surfaces and not the fibrous union that would otherwise result. It is by this means that pain and weakness of the wrist-joint can be prevented. The writer drives an ordinary straight **bayonet-shaped needle** through the fragment into the lower end of the ulna in a direction downward and slightly toward the flexor and radial side of the forearm. When the needle has been driven sufficiently far to fix the styloid fragment, it is cut off with wire clippers, the fascia replaced, and the wound closed.

**HIP.**—G. A. Moore (Ann. of Surg., Jan., 1928) recommends his method of treatment of hip fracture by placing the injured leg in a position of abduction, flexion and internal rotation, approximately in a normal sitting position, and having it so held by a **plaster spica** case during the period of healing.

In *ununited fracture* of the hip, Henderson (Ann. of Surg., May, 1926) recommends an **autogenous bone-graft** to restore as nearly as possible the normal condition. It proved successful in 76 per cent. of

21 cases. In 3 cases a satisfactory result was also obtained by using **beef-bone screws**. The **remodeling operations** of Brackett and Whitman were used in 6 other cases, with good results in all. In the latter group, however, there was more residual stiffness than in the former, and function, although satisfactory, was by no means as good. The duration of the non-union is no criterion in selecting the type of operation, some of the best results having followed the anatomic type of operation, in which the bone graft was used when non-union had existed for 2½ and 3 years. The autogenous bone graft is advocated for cases of non-union of the hip when the patient is in good health, when the disability is considerable, and when enough of the neck of the femur is present.

**KNEE.**—To replace a *ruptured patellar ligament* and *fractured patella*, Gallie and LeMesurier (Jour. of Bone and Joint Surg., Jan., 1927) pass 2 stout **strips of Achilles tendon** through drill-holes in the patella above and the tibia below. Their ends are sutured by silk to hold them in place until they have become firmly healed to the tunnels in the bone. An *united fracture* of the patella near its lower margin may be repaired by approximating the fragments and holding them together by sutures of fascia lata passing around the lower fragment and through drill-holes in the upper fragment. If the *united fracture* is near the lower margin, a long strip of Achilles tendon is passed around the lower fragment and through drill-holes in the upper fragment. The operation is completed by getting as intimate a contact as possible between the 2 ends of the

tendinous transplant, passing 1 through the other, and suturing them together by silk with considerable overlap. To repair a *ruptured quadriceps tendon*, 3 long sutures of fascia lata are used, each passing through a tunnel in the bone, with either end woven several times through the tendon.

**FEMUR.**—Albee (Jour. of Bone and Joint Surg., Jan., 1928) reviews the end-results of 146 cases of *ununioned fracture* of the neck of the femur. In 5 patients seen early and treated with the **Whitman abduction spica**, the results were excellent. In 13 cases incomplete records caused elimination from the study. In 42 of the remaining 128 cases, the **bone-peg** operation was used, and in 53 the **reconstruction** operation. Of the former group, 6 patients refused operation. This left a total of 80 patients operated on (36 bone-peg and 44 reconstruction operations). In 90 per cent. of the bone-peg operations and in 75 per cent. of the reconstruction operations the results were excellent or good, the interval elapsing between operation and the last examination varying from a few months to 15 years. Function was usually good within 6 months.

**ANKLE.**—Robert (Brit. Jour. of Surg., Jan., 1928) found that the use of the **Delbet plaster case** in all cases of ankle injury shortens considerably the period of treatment as compared with other methods, and that it dispenses with the tedious and expensive course of physical therapy required by them. In leg fractures, full weight transmission through the seat of fracture, made possible by using the Delbet plaster, stimulates rapid formation of strong callus and so shortens the period of treatment.

**FOOT.**—Attention is called by Foulerton and Stebbing (Lancet, Dec. 10, 1927) to a fracture of the *base of the 5th metatarsal bone* with *avulsion of the tubercle* from the rest of the base. It is caused, in some cases at any rate, by a sudden contraction of the peroneus brevis muscle and may occur while the foot is off the ground. In this fracture, crepitus is unobtainable. Instead of the fractured surfaces being held in close apposition, the torn-off tubercle is drawn backward by the attached peroneus brevis, and tilted upward in some cases so that there is a wedge-shaped space between the separated fragments, with the base of the wedge downward.

In the diagnosis of fractures of the *os calcis*, according to P. Wilson (Trans. Amer. Med. Assoc., May, 1927), involvement of the calcaneo-astragalar articulation is useful, being an almost constant accompaniment. This gives rise to traumatic arthritis and is the cause of prolonged pain and disability. **Arthrodesis** of this joint cures this condition, and is advocated in fresh cases with obvious joint change and in old cases with continued pain. The report is based on 26 cases.

**FURUNCULOSIS.**—In Bogota, Girardot (Repert. de med. y cir., Apr., 1927) observed an epidemic of boils during hot weather, 70 per cent. of the population being affected. Examination of the pus disclosed *Staphylococcus tetragenes* and streptococci. Muddy water used for bathing was the probable cause. **Autogenous vaccines** proved efficient.

Kissmeyer (Ann. de dermat. et syph., May, 1926) considers **ichthyol** as a

specific for furunculosis. Each furuncle is first cleaned with **alcohol** or **iodine** and then covered with pure ichthyol. A thin layer of cotton is applied over the thick oil of the ichthyol, which soon dries, the small dressing adhering as does collodion. The next day the dressing is removed with tepid water, and the treatment repeated. If suppuration is profuse, the dressings are renewed twice a day. Even 1 or 2 applications cause marked improvement, while a furuncle that has not opened may disappear in a few days. Large furuncles should not be incised, but treated simultaneously with the **galvano-cautery** and ichthyol.

Gazi and Brandi (Klin. Woch., Jan. 1, 1927) puncture the furuncle, aspirate the pus and inject in its place a solution consisting of **disodium phosphate**, 6.49 Gm. (100 grains); **sodium chloride**, 6.44 Gm. (99¼ grains), and water, to 1 liter. The pH of this solution is 9.1. The pain stops for ½ to about 24 hours. They attribute the pain in inflammations wholly to increased acidity of the tissues.

A **bacteriophage** for the treatment of furunculosis has been prepared by the laboratory of the Michigan Department of Health. It is a poly-virulent strain of staphylobacteriophage which has produced lysis of

110 out of 150 strains of staphylococcus. Treatment has been given, in most cases, on 2 successive days, 2 c.c. of the filtrate being injected subcutaneously—the region varying and apparently having no significance. No further injections were necessary, as a rule. Larkum (Jour. Mich. State Med. Soc., Feb., 1928) states that with a single exception all patients (66) treated showed marked improvement.

Junkermann (Münch. med. Woch., Apr. 2, 1926) characterizes surgery in carbuncles and furuncles (except in simple fluctuation) as criminal. He applies **mercurial ointment** in a thick layer on a piece of linen, or, if stomatitis or nephritis sets in, 40 per cent. **sulphonated bitumen**, N. F., in **hydrous wool fat**.

In a severe case observed by J. Hunter (Jour. of Laryng. and Otol., Aug., 1927), affecting the *auditory canal* and recurring off and on during 3 years, **diathermy** proved effective. Tin electrodes were held tightly against the ears and the "heat of toleration" produced. In a minute or 2 the pain was relieved. Treatment was continued for 15 minutes. The patient went home and slept soundly for 10 hours. The pillow was saturated with pus when the patient awoke—the first spontaneous evacuation of pus. No sign or symptom of a furuncle had appeared since the 1st treatment, administered 1 year before the case was reported.

## G

**GALL-BLADDER.—DIAGNOSIS.**—The *Meltzer-Lyon test* is receiving merited attention on the continent of Europe. Chiray and Pavel (Amer. Jour. Med. Sci., July, 1926) hold that it will permit estima-

tion of the contractile capacity of the wall of the gall-bladder and reveal the presence of new syndromes of atony, stasis and perhaps hypertonus of the gall-bladder.

A modification of the Meltzer-Lyon



test is proposed by Hatzieganu and Halitza (Presse méd., Aug. 4, 1926). They inject 0.16 Gm. ( $2\frac{1}{2}$  grains) of *indigocarmine* dissolved in 10 c.c. ( $2\frac{1}{2}$  drams) of water into the buttock, in the evening, 4 hours after ingestion of 200 c.c. ( $6\frac{2}{3}$  ounces) of milk or tea. The next morning, 40 c.c. (10 drams) of 33 per cent. magnesium sulphate are given with the duodenal tube.

The bile obtained within the first 10 minutes after this is a golden yellow, then it suddenly becomes a greenish blue, the characteristic tint of green gall-bladder bile mixed with indigocarmine.

From 10 to 20 minutes later, the bile is again yellow. This sequence was observed in all of 10 subjects with normal livers.

W. P. Murphy (Arch. of Int. Med., June, 1926) used the Rosenthal modification of the *phenoltetrachlorphthalein* test in 50 cases and the so-called icterus index modified from the work of Blankenhorn and of Meulengracht in 206 cases. In order to simplify the *icterus index* test and to make it more universally available for clinical use, he devised a method in which the color comparisons may be made without the use of the colorimeter by using various dilutions of potassium bichromate, which correspond with colorimetric index figures. As compared with the *phenoltetrachlorphthalein* test, information of equal or greater value may be obtained by means of the much simpler icterus index test. The latter is of definite diagnostic value in distinguishing between the primary and the secondary types of anemia. Information of value may be obtained in cases in which obstruction of bile ducts occurs. In fact, the icterus index test

is a test of considerable practical value to the clinician.

According to Schrager and Ivy (Surg., Gyn. and Obst., July, 1928), patients with distended gall-bladder or with stone impacted in the cystic duct suffer from *respiratory embarrassment* during an attack of colic. This symptom has been found of much value in the differential diagnosis of diseases of the gall-bladder and biliary ducts, because it is either absent or not significantly present in any other abdominal complex. Physiologic experiments have demonstrated that distention of the gall-bladder and biliary ducts causes inhibition of respiration, chiefly inspiratory in type. Distention also produces other symptoms, such as nausea, vomiting, and distress, in proportion to the degree of distention of the biliary passages. Distention of the biliary ducts causes more striking symptoms than distention of the gall-bladder alone.

Immerman (Med. Jour. and Rec., Mar. 7, 1928) recalls that there is some difference of opinion as to which symptoms of *indigestion* may be correctly referred to the gall-bladder. The most conventional classification is into (1) gastric; (2) acute cholecystitis; (3) biliary colic groups. The gastric symptoms may be subdivided into (a) those of mild indigestion; (b) of severe indigestion, with discontinuous pain resembling ulcer, or a pressing pain occurring with or without the more typical symptoms of cholecystitis. Based on the observation of many cases, including the material from the Jefferson Hospital Gastrointestinal Clinic, it may be said that epigastric discomfort is very commonly associated with gall-bladder disease, particularly in women. The distress

is sometimes described as a pressure sensation, is partly related and partly unrelated to food, commonly recurs, and may be referred. Under these circumstances a diagnosis of gall-bladder disease may be entertained before the onset of biliary colic.

**PATHOLOGY.**—Caylor and Bollman (Arch. of Path. and Lab. Med., June, 1927) compared the *bilirubin content* of bile from 105 diseased gall-bladders with the anatomic changes in these organs. They found that various pathologic conditions of the gall-bladder are accompanied by definite alterations of the bilirubin content of the gall-bladder bile. In these circumstances the organ as a whole is affected. In acute inflammatory cholecystic disease, empyema, hydrops (cystic gall-bladder) and contracted gall-bladder, the concentrating activity is absent. In cholecystitis with papillomas, associated with hypertrophic rugæ, the concentration of the bile is definitely increased. Between these 2 extremes, a wide variation of the bilirubin content is found.

The comparatively frequent occurrence of a purely *intramural streptococcal infection* is emphasized by Illingworth (Brit. Jour. of Surg., Oct., 1927). The evidence adduced tends strongly to sustain the opinion that spread of the organisms *via* the bile, either from the liver or from below, is not the usual route, and, indeed, probably occurs only rarely.

B. B. V. Lyon and W. A. Swalm (Jour. Amer. Med. Assoc., Mar. 17, 1928) urge that in *early cholecystitis* the reaction to a low-grade inflammation or to subinfection is at first a catarrhal process involving the mucous membrane rather than the serosa, as suggested by Graham. This early

catarrhal process in many cases may be localized chiefly in the cystic duct and is recognizable by only 2 diagnostic procedures—study of biliary-tract drainage and Graham's method. The latter method, however, cannot differentiate between cystic duct obstruction caused by catarrh and that produced by adhesions, stone impaction, or stricture, whereas cystic-duct obstruction when due to catarrh gives an abnormal drainage sequence and a characteristic microscopic picture.

When the catarrhal obstruction is complete the Graham cholecystogram will be positive, thus suggesting cholecystitis of a surgical degree. However, by means of repeated biliary drainage it has been possible to change a positive into a negative or normal cholecystogram. This condition may account for some cases in which operation was performed on the basis of a positive cholecystogram, but in which the surgeon was unable to demonstrate disease of the gall-bladder. These patients with *catarrhal cystic-duct obstruction* unassociated with other pathologic change do not require surgery, but will regain normal gall-bladder function after **non-surgical biliary-tract drainage**. When the obstruction has been overcome the patient may return to the fat-full diet to which he had previously been tolerant.

**TREATMENT.**—A. Bernard (Paris méd., Oct. 8, 1927) advocates **medical drainage** of biliary ducts without the duodenal tube. He administers a cachet containing, along with cholagogues such as **bile extract, combretum, boldo** and **magnesium sulphate** effervescent mixture (a few centigrams of **sodium bicarbonate**

and tartaric acid). Taken with a warm infusion, the cachet dissolves in the gastric juice. The cholagogues enter the duodenum in warm solution and provoke the duodeno-gall-bladder reflex. The cholagogues should be administered between meals, fasting, and at 10 and 11 a.m. and 5 and 6 p.m. He reports 8 cases illustrating the efficacy of the treatment.

**SURGICAL TREATMENT.**—Referring to the recurrence of colic after cholecystectomy, Hueck (Arch. f. klin. Chir., May 20, 1927) states that neither the type of gall-bladder disease, the age of the patient, nor the time of the operation, whether early or late, was found by him to have any important influence on the recurrence of colic after cholecystectomy. Local irritation, as from a stone, or a purely nervous irritation in a distant part may provide the exciting cause, but predisposition appears to be essential.

No certain means of prevention is known.

The persistence of symptoms after removal of the gall-bladder is accounted for, according to Del Valle and Donovan (Arch. Arg. de enf. del ap. dig., i, 605, 1926), by malfunction of Oddi's sphincter, from retraction entailed by the preceding inflammatory process. In 3 cases described, clinically normal conditions were restored by stretching the sphincter and providing for drainage. There was no return of symptoms in the succeeding interval, up to 3 years. In operating on the gall-bladder, this sphincter should be investigated. After correction of the results of shriveling in this region, there is liable to be stasis in the duodenum and right colon.

The results obtained by Fulde (Zent. f. Chir., June 11, 1927) in radical operation for carcinoma of the bile-ducts were of a satisfactory nature. In 1 case of carcinoma of Vater's papilla a cure of 2 years' standing was obtained after transduodenal extirpation. An analysis of the literature of carcinoma of the different bile-ducts showed that immediate operative results are far better with the radical than with palliative operations.

The degrees of malignancy in 30 cases of primary carcinoma of the gall-bladder treated by cholecystectomy were studied by I. M. Webber (Surg., Gyn. and Obst., June, 1927) to determine the existence of a relation between the length of life after operation and the grade of malignancy in the tumor removed. In 12 patients with carcinoma graded 2 or lower, the life average was 2 years and 10 months; 14 patients with carcinoma graded 3 or higher lived an average of only 4.8 months; 2 patients with carcinoma graded 2 are living; 1 has remained in good health 6 years and 7 months, and the other was in fair health 1 year and 1 month. Of 12 tumors graded 2 or lower, 4 were found associated with gross or microscopic evidence of extension or metastasis. Of 14 tumors graded 3 or higher, 13 were found at operation to be associated with evidences of extension or metastasis.

Recalling that Kalk and Schondube suggested (1924) that the gall-bladder could be emptied of its contents by the subcutaneous use of pituitary extract, S. G. Myers (Amer. Jour. Med. Sci., Mar., 1928) concluded that if this drug was efficacious, it could replace the Lyon-Meltzer method of drainage. His studies showed, however, that clinically the use of surgical pituitrin in 1 c.c. (16 minims) doses usually fails to empty the gall-bladder, as judged by results both with the duo-

denal tube and oral cholecystography. It stops the flow of bile in an appreciable number of cases and may aid in the visualization of the gall-bladder. It is markedly inferior to fat in emptying the gall-bladder.

#### GANGRENE.—ETIOLOGY.—

Three cases of gangrene *simulating ingrown toenails* were observed by Wolfsohn (Med. Klin., Dec. 10, 1926) in young men. In all, the condition had been mistaken for the minor disorder and the nail removed. The gangrene progressed, however, and amputation became necessary.

**TREATMENT.**—E. L. Eliason and V. W. M. Wright (Surg., Gyn. and Obst., June, 1926) analyzed 45 cases of *arteriosclerotic* and 55 cases of *diabetic* gangrene of the lower extremities which had been amputated. Their common and dissimilar points were thus shown: They were similar as to circulatory imbalance, but with an added local and general faulty metabolism in the diabetic cases. The choice of anesthetics appears to be **gas-oxygen, short ether and spinal anesthesia**. The authors recommend early and high operation, with less thought of the stump and artificial limb than of reamputation and its high mortality. Early and non-temperorizing operations should be the rule and not the exception. The operative mortality in senile cases was *nil*, but 3.6 per cent. in diabetic cases.

As a complication of severe enterocolitis, an *embolism of the femoral artery* developed in a case observed by J. A. Noble (Brit. Med. Jour., Feb. 11, 1928), through detachment of a thrombus of the iliac arteries. In 2 days, a demarcation of irregular outline was very pronounced at the junction of the middle and upper thirds of the thigh. To prevent mortification,

the writer started periodic **injections** of solutions of **formaldehyde**,  $\frac{1}{2}$  to 1 dram (2 to 3.75 c.c.) into the tissues of the leg. The injections were both superficial and deep, and the strength varied from 2 to 40 per cent., according to the distance from the demarcation line. There was profuse discharge of pus from the demarcation line, and some gas formation in the thigh. The occlusion of the artery spread slowly upward, and in about 2 months the pulsation, which had been felt above Poupart's ligament, had disappeared. A rubber **tourniquet** was applied just below the demarcation line to hasten separation. An **incision** was made below the tourniquet and the bone was isolated. Further injections of formaldehyde were made in and around the sciatic nerve, which was sensitive for several inches below the line of demarcation. Ten days later the sciatic nerve was divided, giving rise to slight and momentary pain. The next day the femur was sawed through about the junction of the middle and lower thirds. The medullary cavity was cleared out for a distance of 4 inches and packed with bismuth paste. The necrosed tissues, still attached to the stump, were dissected off daily. Recovery ensued.

The **ultra-violet rays** were used by Bousfield (Lancet, May 14, 1927) for *bedsores* in old people which had become *gangrenous*.

The results of **suprarenalectomy** in *spontaneous gangrene* were studied by Herzberg (Arch. f. klin. Chir., Oct. 18, 1926) in 110 cases in which the operation was recorded or observed by Russian surgeons. The results were not very satisfactory. In 11 of 54 patients examined for 6 months to 2 years after the operation, the disease process had been brought to a standstill and the patients were able to resume work. In 9 there was improvement. In 32, however, amputation of



an extremity had had to be done. He urges a better classification of cases to exclude those unsuitable for this treatment. The immediate results were often good, whether from release of vascular spasm by diminishing epinephrinemia or from lowering the sympathetic tonus by the section of sympathetic fibers could not be determined.

**GAS GANGRENE.**—Weintrob and Messeloff (Amer. Jour. Med. Sci., Dec., 1927) record 85 cases of gas gangrene in civil practice in which *Bacillus welchii* was the predominating organism. The mortality was 45.9 per cent. In 40 cases of gangrene of the extremities, it was 50 per cent. The indications are as follows: **Early operation**, using **gas-oxygen anesthesia** or, if possible, **spinal anesthesia**. **Long longitudinal incisions** should be made **between and not** through normal muscles, and the injured tissue excised until muscle that is firm, contractile and of normal color, and that bleeds easily, is encountered. The wounds should be left wide open, and irrigated with **surgical solution of chlorinated soda**.

Wanke (Deut. Zeit. f. Chir., Nov., 1926) studied 31 reported cases of gas gangrene *following medicinal injections*. The syringe appears to be the most likely source of infection, the Welch-Fraenkel bacilli being found on 7 morphine and camphor syringe tubes, as they lay ready for use in 96 per cent. alcohol, in the Kiel University surgical clinic. *A syringe tube should be used only once before re-boiling.*

**GASOLINE FUMES, POISONING BY.**—The dangers of automobile exhaust gas in the streets of large cities,

the inside of autobusses, and in repair shops were studied by Bloomfield and Isbell (U. S. Pub. Health Rep., Mar. 30, 1928) in 14 of the largest cities, having a combined population of more than 19,000,000; 250 samples of air were obtained for analysis. The average of 141 tests made in city *streets* at peak hours of traffic showed a contamination of 0.8 part of carbon monoxide in 10,000 parts of air. Only 24 per cent. of all the street samples had more than 1 part of carbon monoxide in 10,000 of air, and in only 1 location, a covered passage-way, was there as much as 2 parts per 10,000. Samples taken inside of *autobusses* yielded even lower concentrations of carbon monoxide. The figures for street air, when viewed in the light of present-day standards of exposure to carbon monoxide, do not reveal the existence of a health hazard from this source in city streets. The potential hazard to the traffic officer may be minimized by diminishing the duration of exposure at the most congested traffic stations. In 102 tests made in 27 *garages* in 14 cities, the average carbon monoxide content was 2.1 parts in 10,000. More than half the samples (59 per cent.) contained more than 1 part of carbon monoxide, and 18 per cent. of all the samples contained more than 4 parts, of this gas in 10,000 parts of air.

The results for *repair shops* showed a dangerous condition. This hazard may be reduced by not allowing motors to run longer than 30 seconds unless the car is in necessary motion or the exhaust is connected to the outside air by a direct airtight outlet of ample caliber.

All of the samples were taken in garages of considerable size. The

great danger to life is unquestionably in the small private garage containing 1 or 2 cars.

Salls (Jour. of Indust. Hyg., Dec., 1927) contends that the *ozone generators* that have been installed in a number of commercial garages and service stations do not convert carbon monoxide into carbon dioxide at a rate that is fast enough, or in proportion that is complete enough, to be of any practical use for the removal of carbon monoxide gas from the atmosphere. It is far better and more effective to open a few windows and permit the removal of the carbon monoxide by the process of natural diffusion; or, if a Sayers-Yant test is positive, to install mechanical ventilation. A suggestion has been made that ozone may be useful in the treatment of carbon monoxide poisoning, but its value for this purpose has not yet been proved. Experiments on known concentrations of carbon monoxide in a small room in which an ozonator was in operation while air samples were withdrawn at regular intervals for analysis by the Sayers-Yant method did not show any evidence of an appreciable action of the ozone on the carbon monoxide.

A case of carbon monoxide poisoning was observed by W. Richardson (Boston Med. and Surg. Jour., Jan. 13, 1927) in a man who had a new automobile of the sedan type, with an exhaust heater in the back. This heater had caused considerable trouble by getting hot even when the valve was turned off. Further, there were wide cracks in the floor boards through which had come the strong smell of exhaust fumes. The patient drove this car largely in traffic for 10 miles or more every morning and evening, and often much farther. He would feel well on getting up, but at about noontime lassitude would begin coming on, until at night he felt absolutely worn out. This feeling was soon accompanied by a severe upper-half headache. The patient was advised to put away the new car for 1

week. By the end of the 3d day the symptoms had entirely disappeared.

**PROPHYLAXIS AND TREATMENT.**—Carbon monoxide poisoning was analyzed by McNally (Arch. of Path. and Lab. Med., Jan., 1928) in 53 instances of death caused by the inhalation of exhaust gas of automobiles in closed garages. A concentration of 2.0 per cent. of carbon monoxide can be easily obtained in a closed garage when the motor is running. To inhale as much as 0.2 per cent. is dangerous. The action of the exhaust gas is due chiefly to the formation of carbon monoxide hemoglobin. Carbon monoxide can be removed from the blood of the patient by replacing it with **air oxygen, pure oxygen or oxygen with 5 per cent. of carbon dioxide**. Deaths due to carbon monoxide in garages can be prevented by providing adequate **ventilation**, with the doors and windows wide open, when one is working on the car with the motor running, or by connecting the exhaust pipe to an outside vent.

A rational treatment of carbon monoxide poisoning in which pressure plays a dominant part is recommended by Schmidt (Münch. med. Woch., Dec. 24, 1926). He fills Thunberg's barospirator with **oxygen under a pressure of 2.5 atmospheres**. At this pressure the blood plasma contains 6 per cent. of oxygen and hemoglobin is not necessary (Haldane). Cats poisoned with carbon monoxide were thus promptly resuscitated.

Mikami (Tohoku Jour. of Exp. Med., Dec. 25, 1926) found that **sodium bicarbonate, sodium carbonate, disodium phosphate and sodium hydroxide** given **intravenously** exert a remarkable inhibitory influence on the

hyperglycemia and glycosuria of a rabbit poisoned by a hypodermic injection of carbon monoxide gas.

**GASSING IN WARFARE.**—Westermarck (Hygiea, Apr. 15, 1927) divides the war gases into different groups, each of which causes its special disease with characteristic symptomatology and pathology and demands its own specific treatment. The 2 most important are the lung-irritating and the blister-causing gases.

To the 1st group belong *chlorine*, *chlorpicrine*, and *phosgene*. They cause edema of the lungs. The hemoglobin may be increased to more than 120, the red blood cells to over 9,000,000. To prevent the pulmonary edema, **emetine hydrochloride** should be given subcutaneously. Stimulants, such as **caffeine** and **camphor**, are indicated.

The 2d group is the vesicant. To this belong *mustard gas* and "*Lewisite*." The 1st was used during the World War. The last has not yet been employed in war. Mustard gas is very poisonous, even in small amounts, and cannot be detected by the sense of smell. It easily penetrates ordinary cloth. The pathologic changes are many. "*Lewisite*" is a heavy oily fluid. It is resistant. A fatal dose on the skin is 1.5 c.c.; it causes burns and arsenic poisoning. As a remedy **benzyl alcohol**, 100 Gm.; **ethyl alcohol**, 95 Gm., and **glycerin**, 4 Gm., is advocated.

That *tuberculosis* can occur as a remote sequela of gas poisoning during the war is emphasized by Achard (Bull. de l'Acad. de méd., Apr. 19, 1927) from personal clinical and X-ray observations, as well as from those of other observers. Tuberculo-

sis occurring recently in persons who suffered gas poisoning during the war assumes a chronic fibrous form and follows respiratory disturbances appearing at short intervals. However, only a history of repeated bronchopulmonary lesions justifies incrimination of gas poisoning in tuberculosis of war veterans.

**GASTRIC ULCER.—SYMPTOMS.**

—The *pain* in this disorder and in duodenal ulcer, according to M. J. Wilson (Arch. of Int. Med., May, 1928), has been ascribed to irritation of exposed nerve-endings in the ulcer base by the acid gastric juice; to sensitization of the pain-producing mechanism in some way by acid; to mechanical irritation by coarse particles of food; to spasm of the pyloric sphincter or of the duodenal cap, and to an exaggeration of the normal hunger contractions, as the term "hunger pains" suggests. The views of the majority may, however, be reduced to 2 main hypotheses, *viz.*, that the pain is caused by "acid" or by muscle tension. Some authors have combined these by suggesting that acid causes hypertonus and pylorospasm, and that, in patients with true achylia, pylorospasm never occurs. In personal investigations on duodenal ulcer patients with pain, the writer found that filling the duodenal cap by manual pressure on the abdomen was followed almost immediately by relief from the pain. In most of these cases the gastric contents were strongly acid. It seems less likely, therefore, that any direct relationship exists between the acidity of the gastric contents and the occurrence of pain in patients with duodenal ulcer. The presence or ab-

sence of gastric peristalsis does not bear any relation to the occurrence of pain. The relief from pain, therefore, is due to relaxation of the musculature of the cap, and, conversely, the pain is due to overaction of the duodenal cap with or without abnormal local contraction or implication of the pyloric sphincter.

In 700 tests, W. L. Palmer (Klin. Woch., Oct. 29, 1927) was able to produce pain in gastric or duodenal ulcer by administration of solutions of hydrochloric acid (0.15–0.5 per cent.). He found no connection between pain and tonus, motility or spasm of the stomach or duodenum. In 8.76 per cent. of the tests made, gastric peristalsis either evoked or increased the pains.

In 62 cases of *acute perforation* of gastric and duodenal ulcer, proved at operation, every patient was a male. K. A. Meyer and W. A. Brams (Amer. Jour. Med. Sci., Apr., 1926) believe that this fact may be of value in the diagnosis of surgical emergencies of the abdomen. Sixty per cent. of the patients were under 40, and 32 per cent., 30 years old or younger. Overdistention of the stomach by food or unusual exertion had comparatively little to do with actual rupture. Perforation occurred during sleep in 5 patients. The clinical picture in the early stages was clear-cut, so permitting a correct diagnosis in 85 per cent. of the cases before operation, although obscured later by the resulting peritonitis and meteorism. The location of maximum pain and tenderness was then often in the right lower quadrant of the abdomen instead of the epigastrium. The presence of free air in the peritoneal cavity on fluoroscopic examination proved of great help in the diagnosis,

both in the early and later stages of perforation. Vomiting always occurred after the onset of the pain, and was present in all but 6 cases, but in no case was hematemesis present. This series showed no marked difference in the mortality rate of gastric and duodenal ulcer. The total death-rate was about 29 per cent., and rose rapidly when operation was delayed.

Krecke (Münch. med. Woch., Dec. 10, 1926) urges the necessity of recognizing the perforation in the first hour, since early surgical intervention within 12 hours is essential for success. The overwhelming pain, extreme rigidity of abdominal muscles, and absence of abdominal respiratory movements are the safest objective signs. The pulse is quite frequently slow (50 to 60) in the first few hours.

Instead of the usual irradiation of the pain toward the shoulder, Siebner's (Deut. med. Woch., July 1, 1927) patient had an excruciating pain in the *right arm* with the other signs of *perforation*. Surgical intervention revealed perforation of an ulcer situated in the anterior wall of the duodenum, near the pylorus. Recovery ensued.

In a case observed by Pauchet (Bull. de l'Acad. de méd., May 11, 1926) the patient had swallowed 4 needles 3 years before; another, a pin 30 years before. The pain and repeated vomiting of blood suggested the diagnosis of gastric or duodenal ulcer. Radioscopy failed to reveal the presence of the foreign bodies. At the operation the needles were found in the duodenum. In the other case the pin was found in the pylorus. No traces of ulcer or cancer could be found.

*Leukocytosis*, especially *lymphocytosis*, characterizes the majority of cases of gastric and duodenal ulcers. Thus, Goyena and Thenon (Semana med.,



May 13, 1926), in 66 cases studied, found the leukocyte count above 8,000 in 56 per cent.; 85 per cent. of the patients had fever, and 48 per cent. had both fever and high leukocyte count. In those without either, the signs of chronic adhesive peritonitis testified to the presence of infection. The lymphocytosis found in gastric ulcer cases led Moreira (Lisboa med., Mar., 1927) to investigate its diagnostic value. Out of 47 cases in various stages, 60 per cent. exhibited a lymphocytosis of more than 25 per cent.; 37.7 per cent., normal values (18 to 25 per cent.), and 2.2 per cent., lymphopenia. The last patient had a severe post-operative anemia. Among 20 cases of gastric tumor, 13 had a lymphocyte count under 18 per cent., 2 between 18 and 25 per cent., and only 5, over 25 per cent. On the other hand, there was absolute leukocytosis in 60 per cent. of the cases of tumor, as contrasted with 34 per cent. in ulcer cases. A relative lymphocytosis is, therefore, a valuable sign in favor of ulcer as against new growth. An absolute leukocytosis points the other way.

**ETIOLOGY.**—Clinical, pathologic and experimental studies have convinced Sennett (Med. Jour. of So. Africa, May, 1926) of the soundness of Virchow's teachings that circulatory disturbance in the smallest arterioles in the mucosa is the basis of the genesis of gastric ulcer. This can be brought about by toxic-infectious causes or by vagotonic and angioneurotic reflex action (constitutional) or by disease of the gastric mucous membrane (gastritis acid) or changes in the vessels (arteriosclerosis, heart failure) or by mechanical factors (stasis, pressure,

blow) or by more than 1 of these factors acting simultaneously, giving rise to local necrosis of the mucosa. Under favorable conditions the necrosis remains localized and superficial (erosion) and shows a tendency to heal, but under unfavorable conditions, such as hyperacidity, deficiency of antipepsin, or conditions of stasis, it penetrates into the gastric wall and becomes chronic, forming the typical chronic gastric ulcer.

*Chronic gastritis*, according to Korsch (Arch. f. Verd., June, 1926), is an important, if not an indispensable factor in the development of a niche-forming ulcer. The evolution and retrogression under treatment can be watched with the gastroscope. Mechanical factors are almost equally important, the ulcer locating at predisposing points in the sagging stomach and duodenum.

According to Mucci (Arch. ital. di chir., Aug., 1926), a loss of balance between the *vagus* and *sympathetic innervation* of the digestive tract is responsible for the ulcer formation. This imbalance may be of emotional or toxic origin or both, but it develops only with a constitutional tendency to neurotic conditions in this region. The logical treatment, therefore, is to block or sever the nerves.

In 22 out of 28 cases of ulcer in families of *syphilitics*, observed by Gougerot (Jour. des prat., Aug. 27, 1927), **antisyphilitic treatment** had a remarkable effect. The ulcer seems to result from a stenosing or thrombosing arteriolitis, the nourishing blood not reaching the mucosa properly. The latter, having become ischemic, does not defend itself well; the gastric or gastroduodenal juice, especially in subjects with hyper-

chlorhydria, consumes the mucosa which corresponds to the vessel involved. The great cause of arteritis and arteriolitis is the spirochete. Two illustrative cases are reported.

According to E. M. Eberts (Can. Med. Assoc. Jour., May, 1928), there are 2 types of erosion—fundal erosions and erosions of the gastric street. The former develop particularly as the result of venous stasis and the spasmodic efforts of vomiting, the latter generally as the result of arterial obstruction, due to muscular spasm, more rarely as the result of emboli or arteriosclerotic change. Fundal erosions, because of their small size, the redundancy and laxity of the mucous membrane, and the lesser concentration of the gastric juice in the zone bordering upon the greater curvature, tend to heal promptly, whereas street erosions, because of their large size, their tendency to gape, their location in a zone of peristaltic unrest, and their longer exposure to a concentrated gastric juice, are less likely to heal, and it is in this type of erosion that the chronic gastric ulcer of the lesser curvature has its origin. Surgical treatment is designed to meet 2 conditions: (1) The removal of the lesion, and (2) the prevention of recurrence by a permanent curtailment of gastric secretion, this being effected by removal of the hormone-producing pyloric segment.

Holm (Ugeskr. f. Læger, Nov. 3, 1927) states that about 20 per cent. of simple non-perforated ulcers are *multiple*. This warns against treatment of the single ulcer and constitutes one of the factors determining the kind of operative treatment. The multiplicity of the ulcers may justify extensive resection, since they are usually close together ("kissing ulcers"), or be an indication for gastroenterostomy, because of the danger from any ulcer not removed by resection.

**PROGNOSIS.**—The end-results of medically treated gastric ulcer were studied by N. W. Jones (Surg., Gyn. and Obst., May, 1926). Of ulcers of less than 1 year's duration, 89 per cent. were apparently cured after periods of time varying from 1 to 5 years; 61.5 per cent. of the chronic duodenal ulcers were apparently cured; but a word of doubt is warranted about the ultimate healing of cases in which there remains definite and permanent deformity. Fifty per cent. of the acute ulcers and all of the chronic ulcers apparently heal with this deformity. Acute gastric ulcers apparently heal favorably under medical treatment.

**TREATMENT.**—According to R. Lynch (Can. Med. Assoc. Jour., June, 1927), after an analysis of the clinical records of 944 cases of gastric and duodenal ulcer, 62.5 per cent. of gastric and 79.5 per cent. of duodenal ulcers respond to the **Sippy method** of treatment. Conversely, Schrijver (Arch. f. Verd., June, 1926) states that, in his experience, an **operation** on the stomach for ulcer cured 95 per cent. It relieved them at the same time of the menace of perforation and hemorrhage. He does not believe that the Sippy treatment will do away with the need of operations for ulcer.

The use of intensive **alkaline therapy** in gastric ulcer is recommended by H. MacLean, I. Jones and G. Fildes (Lancet, Jan. 7, 1928). Sufficient alkali is given to keep the gastric acid neutralized long enough to enable the ulcer to heal. They use a powder of the following composition: **Sodium bicarbonate**, 1 part; **magnesium carbonate** (powdered), 2 parts; **bismuth subcarbonate**, 2 parts.

The dose is 1 teaspoonful every 2 hours, in water or milk. If, after a few days, the patient still complains of persistent pain, the condition is probably not an ulcer, or adhesions to adjacent organs may be present. The method, therefore, is of value as a means of diagnosis. Although it is best for the patient to be in bed during the earlier period of treatment, this is not always necessary, and whether or not complete rest is insisted on must depend on the circumstances. After a few weeks, the amount of powder given is reduced until it is gradually left off. It should, however, be continued for several months, especially in duodenal ulcers.

Akimov (Klinich. Medit., Jan., 1928) stresses his opinion that *vagotonia* is a concomitant phenomenon caused by tissue acidosis, rather than the cause of gastric ulcer. In the light of our knowledge of *vagotonia*, the therapeutic principle underlying treatment should be directed toward the maintenance of the alkalinity of the entire organism.

Sippy's diet is, indeed, a rational symptomatic therapy in so far as it aims to alkalinize the stomach contents, but it does not conform to theoretic physiologic concepts. The Pawlow school has established that milk has a highly stimulating effect on the gastric secretion and remains in the stomach for a long time in the form of casein curds. The writer sees another objection to the Sippy regimen in the hourly feedings, which mean that the stomach is practically never empty. The physiologic periodicity of the work of the digestive glands is likewise disregarded. These objections are absent in the Jarotsky dietetic regimen. Twenty-one patients were placed on this diet with the following effect: 5 were completely cured, 7 markedly improved, 6 improved, and 3 refractory.

On the basis of the atomic theory of disease, which Ellice McDonald and A. Godfrey (Med. Jour. and Rec., May 5, 1926) discuss, gastric ulcer cases have increased cell permeability and increased conductivity. The authors reason that these patients would be deficient in the substances that produce decreased permeability, *i.e.*, chiefly calcium and magnesium. They would have an excess of the substances which produce increased permeability, *i.e.*, chiefly sodium and potassium. Their blood balance would be upon the alkaline side, and they would require the acid-producing substances, like calcium and magnesium. For this reason gastric ulcer patients were treated with **calcium lactate**, to which Collip's **parathyroid extract** was added, and also by the **Jarotsky-Coleman diet** of white of egg, butter, etc. The authors allow all vitamine A substances in the diet, but they endeavor to have the **diet salt-free**, *i.e.*, sodium-free. The dose of calcium lactate was from 15 to 30 grains (1 to 2 Gm.) 3 times daily. Of the parathyroid extract (Collip),  $\frac{1}{10}$  grain (0.006 Gm.) was given 3 times daily by mouth, and every 2d or 3d day 2 units of Collip's parathyroid extract were injected intramuscularly. In markedly alkalosed cases with high plasma pH, **dilute hydrochloric acid** or **dilute phosphoric acid** was given in addition.

Under this treatment the patients gained in weight and improved in appearance. The occult blood in the stools disappeared in 4 to 6 weeks, which was taken as an indication of healing of the ulceration. The treatment was also used as a preliminary to operation, with the view of aiding healing of the wound.

Gastric and duodenal ulcers are treated by Saxl and Kelen (Med. Klin., May 21, 1926) by administration of a 2 per cent. solution of **colloidal silver chloride**. About 2 to 4 c.c. ( $\frac{1}{2}$  to 1 dram) of it is taken in  $\frac{1}{2}$  glass of water before breakfast and before retiring. No alkali must be taken immediately before or after the silver chloride, since it may dissolve it and cause argyria.

Pfab (*ibid.*, May 21, 1926) removed parts of the gastric mucosa in dogs, then—following Saxl's suggestion—administered silver chloride to some of them, and noted a better healing tendency than in the controls.

Feissly (Arch. des mal. de l'app. dig., Mar., 1926) states that daily injections of 15 units of **insulin** for 12 days induced healing of a recurring ulcer in the lesser curvature in a woman aged 37. The healing was confirmed by roentgenograms. The treatment was based on 2 facts, *viz.*, the increase of the alkali reserve in non-diabetic patients under the use of insulin, and the experimental findings showing that the more pronounced the acidity of the humors in dogs, the slower the healing of wounds.

According to Lenk (Wien. klin. Woch., Nov. 17, 1927), **X-ray treatment** of gastric ulcer has a distinct place in cases that are not progressing favorably under diet and alkali treatment and in which there is not a definite indication for surgical intervention. The contraindications are: Suspicion of malignant degeneration, peritoneal irritation, and any organic stenosis. Symptoms of spasm of the gastroenterostomy opening or of a vicious circle are relieved promptly by the X-ray and reoperation may thus be avoided.

The effects of **X-ray treatment** were studied by Solomon (Paris méd., Feb. 4, 1928) in 30 patients with a more or less intense hyperchlorhydria, or with undoubted symptoms of gastric ulcer. He concluded that it is indicated in painful gastric conditions connected with hyperchlorhydria, when the usual drugs have failed. It alone, or in combination with drug and diet treatment, is capable of curing a large number of patients.

Of 12 cases of cavitory ulcer of the lesser curvature treated by Moutier and Porcher (Presse méd., Sept. 7, 1927), 7 of which in radiologic examination resembled spurs or cups and 5 which were real Haudek niches, some were treated by **rest** (in only 4 cases), a **mild lactofarinaceous diet**, and the administration of **bismuth** and **atropine**. Within 10 days the X-ray picture was greatly modified, and the cure was complete in 2 months.

Fishbaugh (Trans. Amer. Gastro-Enterol. Assoc., 1927) advocates the **ambulatory treatment** of gastric ulcer cases, as compared to the bed rest method. It avoids the loss of time and occupation often involved and insures contentment; it prevents the resulting mental distress and invalidism and favors recovery. Experience in the treatment of 200 cases of duodenal and gastric ulcer emphasized the importance of the method.

**PERFORATION AND HEMORRHAGE.**—Out of 32 cases of *perforation* of gastric ulcer reviewed by Söderlund (Practitioner, Mar., 1927), the perforation took place in a completely free abdominal cavity in 31; in the remaining case, peritonitis was limited to the tract above the transverse colon. Of the 32 patients, 31



were dismissed as cured and free of symptoms, only 1 patient dying. The time between the perforation and the operation was usually short—only a few hours—and the majority of the patients were comparatively young; only 12 were 40 years old or upward, but of these 1 had reached the age of 65, 1 of 60, and 1 of 55.

Boas (*Terapia Contemporanea*, June 15, 1926) no longer resorts to feeding by the rectum in cases of *acute hemorrhagic* gastric ulcer. The resulting bowel movements interfere with the action of the measures applied to arrest the hemorrhagic tendency. This objection does not, however, apply to systematic **drip proctoclysis**. Even with cancer of the stomach, it is usually possible to give some nourishment by the mouth. **Rectal feeding** is useful almost exclusively through its effect on the mind, but once a day is sufficient. In rebellious impervious spasm, he advises prompt operation; in inoperable gastric cancer, jejunostomy is preferable to reliance on feeding by the rectum. Nothing is left, he says, of the edifice of rectal feeding erected in the last century except supplying water.

Plehn (*Deut. med. Woch.*, July 2, 1926) uses 600 to 1000 c.c. of **defibrinated blood** for **transfusion** in patients with hemorrhages from gastric or duodenal ulcer. The bleeding stops promptly. Besides this, he observed in 9 out of 11 such patients a complete clinical recovery. The improvement of the subjective disturbances in ulcer patients is so regular that a failure would suggest the presence of cancer.

**SURGICAL TREATMENT.**—Eiselsberg (*Wien. klin. Woch.*, June 24, 1926) has had a 3 per cent. mor-

tality in the last 449 cases of **resection of the stomach** for ulcer, and deems even this low mortality excessive. He doubts whether resection will remain the method of choice in the treatment of ulcers, as it is now. He would welcome the discovery of some internal treatment which would make surgery superfluous.

In Schloffer's clinic (Prague), 399 gastroenterostomies and 238 resections have been resorted to, including cases of bleeding and perforation. A review of these cases by Pamperl and Schwarz (*Beitr. z. klin. Chir.*, cxl, 259, 1927) led them to prefer **gastroenterostomy** for duodenal and prepyloric ulcers. Although they obtain good results with it, they admit that **resection** offers a better chance for cure in this type of case. **Gastroenterostomy**, however, yields the best results in cases with hyperacidity or normal acidity. On the whole, however, Haberer (*Deut. Zeit. f. Chir.*, Mar., 1927) states that surgeons are no nearer than ever to unanimity on this question. He notes a recent tendency to conservatism on the part of some, notably Bier, Küttner and Payr.

Friedemann (*Zent. f. Chir.*, Nov. 26, 1927) has performed 450 radical **resections** for gastric or duodenal ulcer and was able to follow up 374. Of these, 221 were operated on after the **Billroth I** method and 153 after the **Billroth II**. Comparison of the results showed a slight superiority for Billroth I. The cases were observed for 3 to 6 years. At least 95 per cent. were either cured or improved. When the pylorus was resected with enough of the stomach to prevent the presence of free hydrochloric acid, recurrence was rare. The criterion should be how much

stomach was left behind rather than how much was resected.

Referring to his 187 operative cases of peptic ulcer and 20 instances of bleeding ulcers treated by medical measures alone, Bohmansson (*Acta chir. Scand.*, lx, 1, 1926) states that in all the cases examined, he found evidence of *gastritis* independent of the gastric ulcer, and evidently preceding it. Sudden hemorrhage with chronic ulcer calls for operative intervention at once; with acute ulcer, only with vital indications. Post-operative digestion depends more on restoration of normal function than on the chemistry of the stomach. He emphasizes particularly the importance of sparing the circular muscle fibers, the vagus branches, and the main vessels in the submucosa, which all run a parallel course in the stomach. These anatomic structures should be respected to maintain an approximately normal blood and nerve supply and motor function. This can be done best with the Billroth I operation.

The possibility of automatic recovery without treatment or surgical intervention is apparently but about 1 in 4 or less.

In a series of 7700 necropsy records, 120 cases of gastric ulcer were found by Sturtevant and Shapiro (*Arch. of Int. Med.*, July, 1926), of which 34 were healed. Forty-four duodenal ulcers were found, of which 9 were healed. In 5 of these, the gastric and duodenal ulcers were found together, making a total of 159 cases in which either gastric or duodenal ulcers were found, or both. Of the gastric ulcers, 76 per cent. were found near the pylorus; 12 per cent. near the cardia, and 12 per cent. in the midgastric zone. Of 9 ulcers on the anterior surface, 3 were near the pylorus. The duodenal ulcers were nearly all in the 1st portion of the duodenum. In 7 cases of multiple ulcer, the second portion was involved. There were 2 cases of encircling ulcer extending to the end portion.

**GLANDULAR FEVER.**—Carlson, Brooks and Marshall (*Wis. Med. Jour.*, Apr., 1926) describe a widespread epidemic of acute glandular fever. There were over 1100 cases, the greatest number appearing during January, February and March. The epidemic coincided with many of the acute infections present, as septic sore throat and septic tonsillitis in many cases. The complications encountered were otitis media, peritonsillar abscess, nephritis, and in 1 instance, erysipelas. Because of the mildness of the symptoms the disease often ran its course unrecognized. Some of the cases were mistaken for a septic tonsillitis, a septic sore throat, all loosely designated as "grip" or classified as some other acute infection. During the last few years, there have been reported small epidemics of glandular fever in various sections of the country.

**GLAUCOMA.—ETIOLOGY.**—R. R. James (*Brit. Jour. of Ophth.*, Sept., 1927) found 8 cases of *hereditary* glaucoma among 15 members of 3 generations of 1 family. Three of the grandparents were affected and 5 of their children. Only 1 of each family married, and the 2 children of this union are not affected. In the family in which only the grandmother had glaucoma, 3 girls and 1 boy had it. In the family with both grandparents affected, only 1 child, a boy, was affected. One of the affected boys of Family 1 married an unaffected girl of Family 2. Their 2 children are still free of the disease.

Using the slit lamp in some cases of chronic senile glaucoma, A. Vogt (*Schweiz. med. Woch.*, May 8, 1926) observed a fine felt-like structure in

the region of the pigmented edge of the pupil. He attributes it to desquamation of the anterior part of the lens capsule. The author is convinced that this is the direct or indirect cause of senile glaucoma.

**TREATMENT.**—F. P. Lewis (Trans. Amer. Med. Assoc., May, 1927) recalls that inflammatory glaucomatous conditions, whether primary or secondary, are not easily controlled. He found, however, that **myotics** are often preferable to operative intervention, and that inflammatory conditions are quickly relieved by **radiant heat** and **dehydrating applications**, although these are not effective in reducing tension except perhaps by favoring absorption of inflammatory exudates.

H. S. Gradle (*ibid.*) states that in absolute glaucoma, the eyeball may be retained and kept painless in a large percentage of cases by a new operative technique. This consists of **implanting a tongue of conjunctiva** into the anterior chamber of the eye through the scleral incision of a cyclodialysis operation. The conjunctival tongue is sutured in place and the operative field covered with a double conjunctival flap. The 20 patients operated on by this method were observed for varying periods, but all longer than 3 months. Of these, 16 were successful; 4 were failures, necessitating removal of the eyeball.

Belaeff (Medit. Obozrenie, Apr., 1926) resorted to **sympathectomy** for acute glaucoma in 3 cases in which there was more or less impairment of vision in the other eye. The superior cervical ganglion on the affected side was removed under local anesthesia in 2 cases, and in 1 under

chloroform. Notable reduction of the intraocular tension, subsidence of the acute attack, and enlargement of the peripheral visual field were the immediate results. The improvement has persisted for 4 months to date. The anterior margin of the sternocleidomastoid muscle served as the guide in the operation. The writer adds that the endocrin glands may play a certain rôle in the pathogenesis of glaucoma, since the latter occurs mostly at the age of involvement of the sex glands.

In 56 patients with painful glaucoma, Oyenard (Arch. de los Hosp., Buenos Aires, Dec., 1926) **aspirated the vitreous body** 77 times. In 29 the pain subsided after the 1st aspiration. In the others the puncture had to be repeated, in some as many as 4 times. In 3 the method failed and enucleation became necessary.

**GLUCOSE.**—The need for more frequent *testing of carbohydrate metabolism* being recognized, W. B. Lewis (Jour. of Lab. and Clin. Med., Jan., 1927) suggests, as a preliminary test, which may be carried out by any physician, the following: The patient is given 100 Gm. (3½ ounces) of dextrose with instructions to save the urine for 1 hour previous to taking it, in the morning, without breakfast, and for 4 hours following in hourly periods. The patient brings these specimens to the physician, who will make a qualitative sugar test on each, and from this get a very good idea whether any abnormality is present. If there is, a laboratory equipped for chemical analysis of the blood should make a complete tolerance test.

**GLYCOSURIA.**—Galambos (Ann. of Clin. Med., Dec., 1926) emphasizes the important practical fact that the elimination of dextrose is not a continuous process. Glycosuria may be present only periodically, for 1 hour

or so, about 1 hour after the intake of carbohydrates, the 24-hour urine being free of sugar; briefly, the latter will not give the dextrose reaction, while fractional portions, especially those voided from 45 to 75 minutes after the ingestion of the carbohydrates, may contain dextrose in a small portion. This is the *post-cenal temporary glycosuria*. Examination to discover the latter requires arrangement and distribution of the carbohydrates ingested. They are prescribed for a 24-hour period, and are equally divided into 3 portions, taken in 3 similar meals. Both are to be examined, the 24-hour urine, and the single urine portion collected 2 hours after any of the 3 meals. The tolerance test with the 2-hour urine portions covers practically the utilization test for the 24-hour urine. To ascertain the presence of the first traces of dextrose, the most sensitive reaction can be elicited by using Fehling's reagent; the next most sensitive from Nylander's, and 1 less sensitive from Benedict's solution.

That glycosuria may be a benign phenomenon is increasingly being recognized. Holst (Ugeskr. f. Læger, May 12, 1927) examined 150 persons who were denied life insurance on account of glycosuria. All were under observation for from 5 to 16 years. In 70 per cent. no symptoms of diabetes mellitus could be found. He (Arch. of Int. Med., Sept., 1926) also found diabetes mellitus and benign glycosuria in the same family a number of times, and reports cases from 11 of these families in connection with the genealogic trees. With regard to the diagnoses, by diabetes mellitus is understood cases with fasting hyperglycemia, while the term

non-diabetic glycosuria embraces all cases in which the fasting blood sugar is normal without it being due to antecedent dietetic treatment. The glycosuria occurring in the diabetic families was of no definite type, but comprised cases due to alimentary hyperglycemia as well as the renal form. The association of diabetes and non-diabetic glycosuria was observed so frequently that it could not be fortuitous, but must have depended on an hereditary biologic relationship. The restricted material did not permit definite conclusions concerning the nature of this relationship.

According to H. J. John (Surg., Gyn. and Obst., Apr., 1926), glycosuria *during pregnancy* may be and often is a sign of the initiation of true diabetes when the earliest changes, the hydropic degeneration of the beta cells of the islands of Langerhans, are taking place. If the condition is appropriately treated at this early stage, the patient stands a good chance of recovery. Early diagnosis may easily be established by making a blood-sugar estimation 2½ hours after a heavy meal of carbohydrates. If this blood-sugar value is 160 mgm. per 100 c.c. of blood, or more, it can safely be said that the patient is diabetic, but that the condition may clear up after parturition, provided it is properly controlled in the meantime. On the other hand, if the blood-sugar is 90 mgm. per 100 c.c. of blood, or less, it may be known definitely that the renal type of glycosuria is being dealt with, which requires no treatment.

In 8 out of 14 pregnant women Adlersberg and Porges (Deut. med. Woch., Apr. 16, 1926) found an in-



creased permeability of the kidneys for dextrose. Two had a lowered sugar tolerance, resembling diabetes. After 2 to 5 days of a carbohydrate-free diet, the experimental hyperglycemia and glycosuria were more pronounced. They suggest the use of this method in tests for pregnancy.

### GOITERS, BENIGN AND TOXIC.—DIAGNOSIS AND PATHOGENESIS.

—The nature of the goiter, once its presence established, is an all-important feature to be determined, in order to make it possible to direct with precision and rationally the curative measures, medical or surgical, adopted. Here, however, as D. Riesman (Atlantic Med. Jour., July, 1927) well states, "we at once reach an impasse owing to the absence of an entirely satisfactory classification. While that of Plummer is the most widely accepted, a number of writers have voiced objections against it."

According to Sajous (Amer. Jour. of Surg., June, 1927), the underlying cause of what antagonism Plummer's classification has awakened is the unwarranted perpetuation of the prevailing ignorance concerning the functions of the thyroid gland. Plummer himself ("The Thyroid Gland," by Mayo and Plummer, 1926, p. 46) recognizes, in a recent book, that "the chemical reactions carried on by thyroxin in the tissues are not known," while Reid Hunt, of Harvard (Jour. Amer. Med. Assoc., Oct. 18, 1924) held that "the mode of action of iodine in the tissues is unknown." With such a foundation, even the most accurate histologic findings and clinical observations can only be accounted for by mere conjectures. Moreover, without adequate knowl-

edge of the mode of action of the thyroid hormone, the treatment of the various forms of goiter can be based only on empirical lines. This applies also to the surgical treatment of certain forms, notably to exophthalmic goiter, in which surgery unnecessarily sacrifices the organ, sufficiently in some instances to impair its utility to the body at large; medical treatment, if properly carried out, preserves this organ.

Riesman proposes a classification which, though purely clinical and recalling, as he states, that of Marine and several other writers, constitutes an excellent summary of the various forms of goiter observed in practice. These are, briefly: *Simple goiter* (adolescent, endemic, sporadic, adenomatous and colloid); *toxic goiter* (adenomatous, exophthalmic); *malignant* (cancerous); *granulomatous* (syphilitic and tuberculous), and *thyroiditis* (inflammation of the gland). The clinical worth of Riesman's paper is so real and its value to those of our readers who are being misled by the existing confusion so great, that it is reproduced here in great part in so far as its bearing upon the diagnosis of goiter is concerned. The italicized lines represent dominant features of the clinical picture that the prevailing obscurities concerning the functions of the thyroid naturally fail to explain, but which *should* be explained in order to insure rational and successful medical treatment—a virtue which cannot be credited to present-day practice. This explanation will follow the succeeding excerpts from Riesman's paper:

**"SIMPLE GOITER.**—Simple goiter is endemic in large areas of the United States. Its endemicity is

attributed to a deficiency of iodine in the drinking water and the food. But simple goiter is not limited to the goiter belts. It is frequent in Philadelphia and in other cities at or near the seacoast. *With us it is most common in adolescent girls, while in goiter centers it is found in both sexes, although with much greater frequency in the female sex.* Generally there is no difficulty in the diagnosis, but at times the child presents nervous symptoms and tachycardia suggesting the existence of hyperthyroidism. While these symptoms may be due to actual thyroid intoxication, they often come from other causes. They may result from an anxiety neurosis engendered in the child by the mother's fears, or *the girl may have grown too fast so that she lacks strength and stability, such asthenia being often associated with rapid heart.* In one of my own cases—a girl with an adolescent goiter—a mild rheumatic endocarditis was responsible for the cardiac symptoms.

*"The basal-metabolism test is here of much value; it will be found to be normal or subnormal in simple goiter.* There is, however, a group in which, with a subnormal basal metabolic rate, definite thyrotoxic symptoms are in evidence. Martin (Amer. Jour. Med. Sci., Aug., 1926) has reported a series of such cases. They yield rapidly to iodine medication.

*"The importance of correct diagnosis in simple goiter, particularly in adolescent goiter, lies in the fact that, barring exceptional instances, we can assure the anxious mother of the harmlessness of the trouble and the needlessness of surgical treatment.*

*"A simple non-toxic goiter may attain large proportions through col-*

*loid change. For cosmetic reasons or because of serious pressure upon the trachea, the recurrent laryngeal nerve, or other neighboring structures, surgical interference may at times be required. This particular type of case is found especially in goiter districts, or at least in persons who have lived in the goiter belts here or abroad.*

**"ADENOMATOUS GOITER.**—Simple adenomatous goiter, that is, adenoma without hyperthyroidism, is a very common condition. The adenomas are usually small nodular masses from  $\frac{1}{2}$  inch to 3 inches in diameter, and represent circumscribed or diffuse increases in gland acini. They are probably congenital in origin. (Marine and Kimball: Ann. of Clin. Med., May, 1926). As a rule they are symptomless except for the local enlargement, but they may *attain considerable size and exert pressure on neighboring structures, or they may become functionally hyperactive.* This occurs usually in persons over 40, and causes a form of hyperthyroidism closely resembling that of exophthalmic goiter.

**"TOXIC GOITER.**—The diagnosis of toxic goiter, whether adenomatous or exophthalmic, is based on a group of rather striking symptoms, among which the most important are the goiter, nervousness, tachycardia, tremor, certain eye signs, and a supernormal basal metabolic rate. The cardinal symptoms, as they are called, are not always present in their totality, so that it is a good rule, when a patient has prominent eyes and palpitation, to think of the possibility of hyperthyroidism. The goiter may be small, or it may be retrosternal and not visible. The eye signs are often not marked in toxic adenoma. Moreover,

tremors and nervous erethism are found in various forms of neurasthenia. The effort syndrome of war time, which is by no means uncommon in this present era of supposed peace, may closely resemble toxic goiter. Another not infrequent mistake to which Musser (Ann. of Clin. Med., Feb., 1926) has called special attention is to interpret early tuberculosis as exophthalmic goiter. The eyeballs are sometimes very prominent in chronic glomerular nephritis, and might cause the latter to be mistaken for toxic goiter. The surest way to arrive at a correct diagnosis is by means of the basal metabolic rate, which in toxic goiter is practically always raised considerably above the normal. . . . In the latter months of pregnancy the basal metabolic rate may be 25 or 30 per cent. above normal without any hyperthyroidism. (Mussey, Plummer and Boothby: Jour. Amer. Med. Assoc., Sept. 25, 1926).

"There is something peculiar about the nervousness of goiter patients that serves to differentiate it from ordinary neurasthenia or psychasthenia. *There is an intense motor restlessness; the patient cannot sit still in one place, he beats a tattoo with his feet, crosses and recrosses his legs at frequent intervals*, etc. His movements, though not inchoate like those of chorea, have something of the quick and restless character of that disease.

"To the experienced hand, *the skin has a suggestive feel; it is warm, moist, thin and delicate, and usually shows dermatographia*. The heart action, apart from being rapid, has a peculiar quality; the sounds are snappy and hard, differing from those heard in tachycardia of non-thyroidal origin.

"An interesting and at times diagnostically valuable feature is presented by the blood-pressure. In a large proportion of my own cases, larger than in some of the statistics I have seen in literature, the systolic pressure was high and the diastolic low—at times as low as in aortic insufficiency.

"Great loss of weight in spite of a large food intake is very suggestive of hyperthyroidism when diabetes is excluded.

"*In some cases the temperature is persistently elevated, running between 99° and 100°, often for months, and occasionally for years.*

"The Goetsch test and the Kottmann reaction are of little value in the diagnosis.

"With regard to distinguishing between early tuberculosis and the milder types of exophthalmic goiter, it is necessary, besides determining the basal metabolic rate, to make X-ray studies of the chest, sputum examinations, and to keep careful temperature records—in fact to do all we have learned to do in order to make sure of the diagnosis of incipient tuberculosis.

"Hyperthyroidism due to toxic adenoma usually develops after the 40th year; exophthalmic goiter is more often a disease of earlier life.

**"MALIGNANT GOITER.**—Malignant goiter is so serious a condition that it should be diagnosed as early as possible, since delayed operation means local spread and distant metastasis. Unfortunately, many are in the beginning encapsulated and appear to be ordinary adenomas. By bearing in mind the following points a timely diagnosis may be arrived at: (1) Carcinoma usually develops in a

preëxisting adenoma. (2) If a nodule long quiescent in a person over 40 takes on sudden growth, the probabilities are that cancer has developed. (3) A hard nodule in an individual of the cancer age, between 40 and 50, with normal basal metabolic rate, should be viewed with suspicion. (4) Extension of the growth to neighboring glands, to the lungs, to the recurrent laryngeal nerve, is convincing but belated evidence of malignancy. (Herbst: Mayo Clinic, 1923; Simpson: Ann. of Clin. Med., Feb., 1926; Speese and Brown: Ann. of Surg., Dec., 1921; Graham: Surg., Gyn. and Obst., Dec., 1924).

**"INTRATHORACIC OR ECTOPIC GOITER.**—The existence of such a goiter can be conjectured by finding an area of percussion dulness over the upper sternal region larger than normal. It is confirmed by an X-ray examination. The characteristic radiologic finding is a crescent-shaped mass in the upper mediastinum which may be distinguished from an enlarged thymus or thymic tumor by the fact that the latter is not crescentic but trapezoidal in shape, widening out toward the base.

"Aberrant thyroids are small nodules of thyroid tissue found in regions of embryonal clefts—in the lingual or medial region, and laterally beneath the sternocleidomastoid muscle. The median ones, by enlarging, may be the cause of pressure symptoms. They rarely become malignant. The lateral nodules have a decided tendency to cancerous change (Hall: Atlantic Med. Jour., July, 1926).

**"GRANULOMATOUS GOITER.**—Both syphilis and tuberculosis occur in the thyroid gland, but they are so rare that little need be said about

them. In the case of demonstrated syphilis reported by Groedel and Hubert (Schweiz. med. Woch., July 16, 1925), the characteristic features were marked tenderness on pressure and a positive Wassermann reaction. There are, however, cases without pain, and in them syphilitic manifestations must be looked for elsewhere. A positive Wassermann aids in diagnosis.

**"CHRONIC LIGNEOUS THYROIDITIS (RIEDEL'S STRUMA).**—This condition presents itself as a stony-hard, goitrous enlargement of the thyroid gland, with adhesion to the neighboring structures. It resembles carcinoma, but in the latter, if the growth is at all adherent, it also involves the skin. Ligneous struma does not. Thyrotoxic symptoms are absent, nor is there any evidence of myxedema. Tremor and nervousness may be present, but the basal metabolic rate is usually normal. Fever is absent in the majority of cases. The etiology of this affection is unknown. Bacterial studies so far have been negative."

The functions attributed by Sajous, in the previously quoted article, to the thyroid gland, explain all the symptoms observed which are strictly ascribable to variations of the functional activities of the organ—those presented in italics in Riesman's article.

According to Sajous (Sr.), the thyroid gland contributes to the body at large a secretory product which in 1907 he termed "thyroidase." This hormone, of which iodine is the active agent, is endowed with catalytic properties by the admixture of the catalytic oxidizing enzyme adrenoxidase, a product of the adrenal medulla



(epinephrin, or adrenalin). Kendall's thyroxin (1914) is the active principle of thyriodase. *The function of thyriodase is to activate thermogenesis, or heat production, and thus to accelerate metabolism by increasing the sensitiveness or lability of the lecithin*—a phospholipoid which occurs in all tissue cells and certain fluids—to oxidation. An important feature of this function in its bearing upon the pathogenesis of the various forms of goiter is that *the heat energy liberated by the action of thyriodase on lecithin is to increase the activity of the body enzymes which break up by hydrolysis various tissue wastes and bacterial toxins, thus protecting the body against the morbid effects of these pathogenic agents*. Briefly, the thyroid gland sustains heat production and metabolism and simultaneous catabolism of wastes and organic poisons.

Bearing this dual function in mind, it becomes possible to explain rationally the various forms of goiter and to institute methods of treatment which are logically indicated and which have demonstrated their value. This will be done under TREATMENT in this article.

Special attention has been given recently to the "goiter heart," meaning thereby the lesions or functional disorders which certain goiters, the toxic series especially, awaken. They are, indeed, more frequent than is generally believed. A. W. Meyer and Sulger (Med. Klin., May 28, 1926), for instance, found, among 90 goiter patients, 39 with enlargement of the heart. Both ventricles were usually affected. It was more frequently due to stenosis of the trachea, they think, than to hyperthyroidism. Reëxamination of the patients who

had been operated on revealed a persistence of the hypertrophy in all but 7 cases. Some (14) of the others—including those who had had normal hearts previously—had a larger heart 2 or 3 years after the operation than they had had before.

Loeper and Mougeot (Presse méd., May 12, 1926) relate 3 of their 5 cases of *mitral insufficiency* in which symptoms of decompensation appeared simultaneously with enlargement of the thyroid. In 3 other cases, on the contrary, the goiter had preceded the dilatation of the left heart and mitral insufficiency. They explain the heart phenomena mainly by compression of the right vagus and mechanical stimulation of the heart depressors by the encroaching enlargement of the thyroid. Compression of the vessels in the neck, especially of the carotid, is a further coöperating factor.

*Arrhythmia* and *cardiac insufficiency* are attributed to exophthalmic goiter by Lian, Lyon-Caen and Pollet (Presse méd., Jan. 8, 1927), who found them in 10 per cent. of their cases. In simple goiter, arrhythmia is not unusual. Paroxysmal fibrillation associated with flutter is the most frequent form of the arrhythmia. Auto-intoxication with abnormal products of thyroid secretion they deem to be the cause of the arrhythmia.

Attention is called by F. O. Deneen (Ill. Med. Jour., Nov., 1926), to the 4 different alterations in the *blood-pressure* that may be found in conjunction with goiter heart. There is also a metallic quality to a goiter heart-beat and a peculiar murmur in the pulmonic and aortic areas. Usually, the size of the heart is not

changed, and the worst symptom is tachycardia, which may progress by easy stages to palpitation and later to rapid auricular fibrillation. Some patients show ordinary hypertension, with an increase in both the systolic and the diastolic pressures. In cases of extreme tachycardia there may be normal systolic and very low diastolic readings. Where the systolic pressure is low and the diastolic normal, extreme exhaustion seems to be the rule.

F. Cohen (Amer. Jour. Dis. of Childr., May, 1926) found, in a survey of 11,084 school girls and 783 school boys in New York City, that the incidence of simple goiter in school children and in the older group of women, and the investigation into the conditions of iodine intake which determine endemic centers of goiter, do not justify a conclusion that New York City is an endemic center of goiter. The mild sporadic cases of simple goiter which occur among school children seem to be dependent on a relative insufficiency of iodine, due mainly to a physiologic cause, *viz.*, puberty. Thyroid enlargements occur in New York City about 3 times more frequently in girls than in boys. Simple goiter among children in New York City reaches its peak at puberty, between the ages of 13 and 15, in both girls and boys. The percentage of incidence of normal glands seems to vary inversely with the degree of activity of the menstrual cycle. The mild cases of simple adolescent goiter observed among children in New York City seem to show, in the case of girls, a distinct tendency to spontaneous regression after puberty; in that of boys, a complete regression.

**TREATMENT.**—The summary of Riesman's article presented under the preceding heading succinctly reviewed the symptomatology of the various forms. The prevailing lack

of knowledge concerning the rôle of the thyroid hormone preventing, however, a rational medical treatment in lieu of the prevailing reckless use of iodine in any form of goiter, regardless of its logical indication, it was stated that the functions attributed by Sajous to the thyroid made it possible to interpret intelligently the various symptoms while eliminating the empirical and often harmful modes of treatment now in common use. These functions were described in the preceding pages. The consequent explanation of the morbid influence of the main forms of goiter on the body at large and their logical treatment may be summarized thus:

As to *adolescent goiter*, the enlargement represents a compensative effort on the part of the thyroid. As a result of lesions in the organ due to focal hemorrhages during diseases of childhood, heredity, etc., the gland cannot meet the needs of adolescence, especially where abnormal growth has increased them, and augments its activity to meet the issue. In doing so it swells, thus becoming a "goiter." What is lacking here is thyroiodine, which the administration of *some form of iodine*, or *thyroid gland*, supplies.

Occasionally, however, the gland is large enough to compress the trachea and cause dyspnea. The causal colloid is *increased by iodine*. Hence the fact that surgical measures, *viz.*, *ligation of certain thyroid arteries*, or *partial thyroidectomy*, are deemed necessary. Sajous, however, found that *small doses of thyroid and ergotin* (1 grain—0.065 Gm.—*t. i. d.*), the latter agent by causing vaso-constriction in the gland, usually avoid the need of operation.

*Adenomatous goiter*, if unattended by symptoms, and insufficiently large to warrant removal for cosmetic purposes, had better be left alone, but examined periodically. *Iodine is worse than useless* in this form. It tends to become transformed into a toxic goiter and *iodine favors this morbid change*. Symptomless and large goiters, so commonly observed, are *preferably removed surgically*, especially if they cause pressure dyspnea or aphonia.

*Toxic goiters*, including exophthalmic goiter, according to Sajous, are forms in which *both iodine and surgical removal* are contraindicated, contrary to prevailing ideas. He deems it absolutely wrong to expose the patient to operative or post-operative death—8 per cent. when all operators, good, mediocre and incompetent are taken into account—and to the chances of recurrence frequently observed. Especially is this true when, as is the case in his own practice—provided 2 years, except in mild cases, are devoted to the treatment and the patient follows strictly all directions—all cases can be cured without danger to life or of recurrence.

In such cases the underlying cause is a toxemia, due to some "focal" infection originating in the tonsils, teeth, nasopharynx or sinuses, the intestinal canal or uterus in most instances.

The *toxemia* present, by *exciting the thyroid to inordinate activity*, accelerates metabolism by increasing excessively the thermogenic activity of the phospholipoid lecithin in all tissues, thus provoking the intense heat, excitability (the cerebrospinal and nervous systems being rich in lecithin), and the pronounced asthenia and

emaciation (lecithin being intimately related functionally with tissue fats).

The treatment—not only logical but successful—is thoroughly to *seek out and remove any causal toxemia, "focal" or general*. Concomitantly, the swelling due to inordinate stimulation of the gland should be *counteracted by vaso-constrictors* which, by reducing the arterial blood admitted to the organ, increasingly lower its functional activity. The best agents are **ergotin** (1 grain—0.065 Gm.) and **quinine hydrobromide** (5 grains—0.3 Gm.—for adults), *i.e.*, the Forchheimer method. **Rest** is the most important of all adjuncts and, if practicable, greatly hastens the rapidity of the cure. **X-ray** applications, once every 3 weeks, also tend to counteract the erethism of the gland, while **ice compresses** on the organ, and **bromides**, to counteract restlessness, are useful, **chloral hydrate** being added, if needed, to prevent insomnia. A **diet poor in proteins** tends greatly to decrease the functional activity of the gland.

The direct injury of the excess of thyroiodase secreted is upon the tissue lecithin, which it consumes in corresponding excess. The logical treatment is to administer **lecithin** in 5-grain (0.3 Gm.) doses before meals. The patients soon show signs of increasing strength and weight, while the heart, whose **cuorin** (the cardiac lecithin) is supplied anew with its physiologic thermogenic agent, gradually resumes its normal rate, in lieu of the often distressing tachycardia.

Occasionally cases are encountered in which *tuberculosis* is suggested by the symptoms of toxic goiters.

According to E. P. Sloan (Jour. Amer. Med. Assoc., June 18, 1927), in

both toxic goiters and tuberculosis sympathetic disturbance and loss of weight are observed despite increased appetite. The symptoms of the 2 conditions are often similar; indeed, almost identical. One is inclined to think that in many cases they actually are identical, and that both are present. Many are inclined to believe nowadays that the exciting cause of exophthalmic goiter, in the majority of cases, is infection. If this is so, one can hardly conceive of normal thyroid function in the presence of the long-drawn-out toxemia of tuberculosis. A toxic dysfunction of the thyroid will explain many of the symptoms of atypical tuberculosis.

In the light of Sajous's interpretation of the functions of the thyroid, the explanation of this enigma is plain. Both conditions being due to a toxemia, the thyroid's defensive functions are brought into play, thus evoking a similar symptom-complex.

O. Susani (Deut. med. Woch., June 3, 1927) states that he almost invariably found an active tuberculosis coexisting with parenchymatous goiter. He concludes that, in Vienna at least, there exists a direct connection between these affections. In truth, all he witnessed in his cases of tuberculosis was a defensive reaction of the thyroid against the pathogenic organism and its toxins.

Again, in the treatment of exophthalmic goiter, F. Boenheim (Aerztl. Rundschau, No. 17, 1926) attributes an important rôle to the thymus gland, and states that he has used **thymus** medication in a great many cases with remarkably good results. This is readily accounted for by Sajous's views, since, as previously stated, **lecithin** is of great efficacy in toxic goiters. Lecithin being the active agent of the nucleins supplied

to the body at large by the thymic cells, the administration of thymus gland really means the therapeutic use of lecithin.

There is a decided opposition in many directions to the careless use of **iodine**, or of the preparation now generally used, **Lugol's solution**. So competent a surgeon as Goetsch (N. Y. State Jour. of Med., Oct. 1, 1927) condemns its indiscriminate use. He says that iodine in exophthalmic goiter should be reserved for the period immediately *before operation*, and then be given intensively in doses of 10 minims (0.6 c.c.) 3 times a day over a period of only a week or 10 days. He counsels great caution in treating the pregnant woman with iodine.

**GONORRHEA.**—Pelouze and Schofield (Jour. of Urol., Apr., 1927) conducted a large number of tests calculated to establish, if possible, the existence of a bacteriophobic or *lytic principle* elaborated by the gonococcus. They found that this organism, during its process of autolysis, produces a substance that is lytic to other gonococci. Clinical experience with *gonophage* also showed that the gonophage does have some favorable action against the disease in some individuals, and that other ways of using it might give better results. The occurrence of systemic and local metastases, as well as the presence of gonococci in the urethral and prostatic secretions in some patients long after the administration of gonophage, indicates that it does not materially affect the systemic immunizing processes.

According to Joachimovits (Zent. f. Gyn., July 14, 1928), the presence of Gram-negative gonococci was defi-



nately shown in 2 specimens of *vaginal secretion* dried on linen 12½ months and 17 months after the specimen was taken. This shows that in women the causative organism of gonorrhea in the secretion dried on the clothing can still contaminate almost 1½ year after the infection has existed in them.

Hotta and Schwarz (Zent. f. Gyn., July 21, 1928) found that *inactive serum* is far superior to active serum for diagnostic purposes, after a study of 56 cases. Precise results were obtained in 78.57 per cent. of the clinically positive and 89 per cent. of the clinically negative cases. Thirty-six of these patients were then tested with active serum according to Bruck's method. Correct results were obtained in only 30 per cent. of the clinically positive cases.

Heyn (Münch. med. Woch., June 17, 1927) found, after a large series of tests, that the acidity of the vaginal secretion is the same in gonorrhea as in other diseases of the cervix or vagina.

**TREATMENT.**—In the treatment of gonorrhea in women, Statham (Brit. Med. Jour., Mar. 31, 1928) employs a 1 per cent. solution of **mercurochrome-220 soluble**. In cases in which the gonococcus seems resistant to mercurochrome a change is made by using a 1:1000 solution of **flavine**, and then reverting to the mercurochrome. Williams and Small (U. S. Naval Med. Bull., July, 1927) found that **mercurochrome** is of considerable value in shortening the course of the disease, preventing complications, and alleviating the crippling effects of complications. A striking point observed was the early and complete subsidence of distress-

ing subjective symptoms following administration of mercurochrome-220 soluble and **milk**.

A. Poska (Northw. Med., June, 1926) uses a new device for the efficient treatment of *cervical gonorrhea*. It consists of a section of glass tubing 20 to 24 cm. in length and 5 to 8 mm. in diameter, with an internal diameter of 2 to 6.25 mm. One end has a 2 to 2.5 cm. bevel, while the opposite end is ground square with the sharp edge rounded off. The beveled end is designed to facilitate the loading of the device and to minimize the soiling of hands or clothing with the medicament. A glass rod for the larger sizes, and the long round wooden applicator for the small sizes, act as a plunger.

F. Wolff (Zent. f. Gyn., Apr. 17, 1926) studied the value of **vaccine** in 100 refractory cases of gonorrhea in women. He injected intramuscularly freshly prepared vaccine, killed with ½ per cent. phenol, and used within 4 or at most 8 weeks. A dose of from 500 millions of germs upward could be safely given twice a week. The reactions were less marked than those produced with commercial vaccine, because endotoxins from decomposition of cocci were absent from the fresh product. The source of the organisms should be a clinically virulent case of acute gonorrhea or acute complications. In about 40 cases he used living vaccine and found it superior in action to killed vaccine. There was no metastasis from its use. The inoculations were made in 3 or 4 wheals in the subcutaneous tissue of the arm or thigh, the size of the dose being relatively unimportant. The reaction at the site of vaccination gave rise to a true phlegmon.

This passed off in 1 to 3 days, however, leaving a hard infiltration at the site of the wheal. Vaccination must not be repeated before this infiltration is absorbed. If 1 repetition fails, there is not much hope in continuing. The abscesses contain living gonococci and no other organisms. All cases but 1 were followed by clearing up of obstinate foci in the cervix. Urethral gonorrhea in women is not helped by vaccination, as its effects do not extend to the surface of the mucous membrane. The writer had better success with autogenous than with heterogenous vaccines, and found that the organisms should not be from too old strains. Patients greatly weakened by chronic disease should not receive vaccine treatment.

Loeser (Amer. Jour. of Obst. and Gyn., Sept., 1927) resorts to the injection of **live gonococci** to cure gonorrhea. From the pus of a patient, male or female, with acute gonorrhea, a pure culture is made on ascites-blood agar (half and half). The gonococci should be isolated quickly and pass back into the human body after from 24 to 48 hours on the artificial medium. The longer they live on the culture medium, the more they lose their therapeutic efficiency. The germs, grown in this manner on ascites-blood agar in a long serpentine line, are washed off in 3 c.c. of physiologic sodium chloride solution. This suspension is taken up in a syringe, and 0.5 to 1 c.c. of it is injected subcutaneously into the upper arm. One culture tube, as a rule, will suffice for 3 patients. Complete disappearance of all gonococci is usually achieved within 8 to 14 days after the injection. The writer has

treated 118 women suffering from chronic gonorrheal processes. Of these, 68 were cured with a single injection and 5 others with 2 and 3 injections, respectively. All had been treated either with vaccines or locally, without success.

M. L. Boyd (Jour. of Urol., Jan., 1928), using a 1:1000 aqueous solution of the English preparation (Boots) of **acriflavine**, was able to control *acute gonorrheal urethral infections* completely, provided the treatment was begun before the infection reached the posterior pendulous or bulbous portion of the urethra. Two injections were made daily, 1 in the morning and the other in the late afternoon, no other medication being used during the 1st week, unless it be some mild urinary sedative. After voiding, the patient lies down and about 1 or 2 drams (4 to 8 c.c.) of the solution is injected into the urethra. This is held in with pressure by the forefinger and thumb on the urethra back of the glans. A piece of absorbent cotton about 1 inch wide and 3 inches long is then laid over the meatus, with its ends carried back above and below the penis, and the pressure on the urethra is released. Around the penis is wrapped another similar piece of cotton and the patient is kept lying on the table for 10 to 15 minutes with the penis held upright. By the end of that time nearly all of the acriflavine has oozed out of the urethra into the cotton. Usually after the first injections of acriflavine there is marked improvement. The discharge often disappears in 24 hours. Rarely is there any evidence of activity after 48 hours. In most cases the gonococci have disappeared from the dis-

charge after 24 to 48 hours. After 6 or 7 days the acriflavine treatments are stopped and irrigations of warm, weak **potassium permanganate** (2 grains—0.13 Gm.—to a quart) are given once or twice a day. At home the patient employs a urethral injection of either a 5 per cent. aqueous solution of **neosilvol** or a 1 per cent. aqueous solution of **protargol**.

Jausion and Pecker (C. r. Soc. de biol., Jan. 28, 1927) employed **pilocarpine** as an adjuvant of **acridine** in 29 patients with gonorrhea. A dose of 5 c.c. (80 minims) of a solution containing 0.02 Gm. ( $\frac{1}{3}$  grain) of **diamino-acridine chloromethylate** and 0.001 Gm. ( $\frac{1}{64}$  grain) of **pilocarpine nitrate** per c.c. (16 minims) was injected intravenously and repeated at intervals of 1 day. Discomfort from the injection did not last more than  $\frac{1}{2}$  minute. Usually, 9 injections led to recovery or great improvement.

The **malaria treatment** has been tried by various observers. It showed, however, no advantage over the measures recently employed, though shortening the course of the gonorrheal infection. In little girls it proved of no value, while in women it shortened the period of incubation. Scherber (Wien. klin. Woch., Nov. 3, 1927) found that in the majority of cases **malaria** causes the subacute and chronic infiltration foci in the connective tissue to be absorbed, while in other cases no improvement is noted. It is not a cure, but is an auxiliary remedy. Of all fever treatments, malaria is the most effective on the gonorrheal processes of mucous membrane and of connective tissue.

**GOUT.—PATHOGENESIS.**—The pathogenesis of this disorder is

still a subject of dispute. Gudzent (Klin. Woch., June 11, 1926) denies the causal connection between uric acid and the attack of gout. The tophi form and disappear sometimes without any subjective sensations. The acute attack seems to be of allergic nature, and is induced by individually different elements of the food. One of his patients tolerated a synthetic alcoholic beverage although he could produce an attack by drinking a certain brand of champagne. Injections of uric acid derivatives did not give decisive results in Heyd-kamp's experiments (Zeit. f. klin. Med., Feb. 9, 1927). He suggests that these compounds have a specific dynamic action which results in the excretion of a larger amount of uric acid than would be expected from the amount injected.

An accumulation of *calcium salts* in various areas was recorded by Fock (Finska Läk. Handl., Jan., 1927). His patient, a woman of 44 years, had been suffering for 10 years from hard deposits under the skin with severe pains in the joints, diarrhea and headache. By scratching the skin the patient was able to remove a grayish white substance, which solidified in the air. The deposits under the skin were found on the fingers, toes and arms, and their appearance was preceded by attacks of pain and local swellings. Examination of some of the material removed from the right arm showed its composition to be: 57 per cent. tricalcium phosphate, 17 per cent. calcium carbonate and 23 per cent. organic constituents. The periosteum and the bone itself showed no pathologic changes.

**TREATMENT.**—Faber (Ugeskr. f. Læger, Mar. 17, 1927) identifies 3 stages of the disease: Acute attacks, joint deformities and chronic anomalies of metabolism. In *acute attacks*,

the patient should **remain in bed**. From 1 to 1½ liters (quarts) of **milk** and from 3 to 5 mgm. ( $\frac{1}{20}$  to  $\frac{1}{12}$  grain) of **colchicine** in 4 doses at ½-hour intervals are given daily and continued until diarrhea sets in, when the drug should be discontinued. The pain then ceases in almost every case, the attacks disappearing in a few days. In *chronic metabolic disturbance* cases, the patient should remain on a **purin-free diet**. Treatment of chronic deformities of the joints does not differ from that in similar diseases. In the *infectious types* of chronic polyarthritis, it is important to **locate and remove the focus of infection**. Where this is impossible, **protein therapy** gives good results. In a majority of polyarthritic cases, **physical therapy** proves useful. **Salicylic preparations** and **cinchophen** relieve the pain. The general arthritic condition is usually produced by pathologic conditions of the blood, muscles, or connective or subcutaneous tissues.

#### GRADENIGO'S SYNDROME.

—Very little concerning this syndrome has as yet appeared in general medical literature, according to the Boston Medical and Surgical Journal, Jan. 12, 1928. The syndrome follows acute infections of the middle ear, and comprises 3 outstanding signs: Acute suppurative otitis media, severe temporo-parietal pain, and

paresis or paralysis of the abducens nerve on the same side. The severe pain over the distribution of the trigeminal nerve, peculiar in that usually only the upper branch of this nerve is involved, may come on immediately, or sometimes 6 to 8 weeks, after the acute otitis media. The abducens paralysis often appears suddenly, the patient 1st noticing diplopia. This lesion is more likely to occur after the temporo-parietal pain, on an average 30 to 50 days after the acute otitis. It appears that the pathologic lesion must center about the apex of the petrous portion of the temporal bone. The 6th nerve, in its course from the medulla to the external rectus muscle, passes directly over the tip of the temporal bone, sometimes lying in a bony canal 1st described by Dorello and referred to by Gradenigo in his original article. According to H. H. Vail, the nerve is especially liable to compression by slight inflammatory swellings in this locality. In close proximity to Dorello's canal is the posterior root of the 5th nerve. The paralysis usually clears up in a few days or weeks, although some cases of permanent damage to the nerve have been reported. The treatment lies in the field of the otologist, since the neurologic symptoms depend upon the primary condition in the middle ear. In some cases **mastoidectomy** is indicated.

## H

**HAY FEVER (HYPERESTHETIC RHINITIS).**—Skin tests were performed by L. B. Baldwin (Jour. of Immunol., May, 1927) from 3 to 4 years in 36 individuals who had

undoubted hay fever unilaterally or bilaterally. One gave a positive skin reaction without clinical signs of hypersensitiveness, and 5 developed positive skin reactions while under



observation and also contracted hay fever. The skin reaction was negative at the onset of hay fever in 1 case, but became positive the following season. It was less intense the 1st season, and became more so the following season in another case. In the other 3 cases the skin reactions became positive shortly before or during the onset of hay fever, and have not varied since.

*Cumulative immunity* of hay fever was studied by A. G. Gould (Boston Med. and Surg. Jour., May 20, 1926) in patients treated 1, 2 or 3 years. It became evident that some patients do have a worth-while cumulative immunity and others do not. Two persons from the same community having the same objective degree of hay fever are apt to show under treatment various amounts of relief even when treated with the same kind and lot of pollen extract. Two patients under similar conditions receiving about the same amount of relief from preventive inoculations are very apt to show in years without treatment different amounts of cumulative immunity. Statements to patients as to the amount and duration of the cumulative immunity should be guarded.

**TREATMENT.**—Albert and DeBell (Cal. and West. Med., July, 1927) call attention to the fact that Nevada contains many hay fever plants and that the victims are proportionately numerous. The results of **preventive treatment** by means of the appropriate **pollen extracts** have been very encouraging. Out of 17 persons who had been tested, 5 obtained complete relief. In the remainder the relief was considerable. In 1 it was only 25 per cent.; in 4, from 50 to 60 per cent., and in 7, from 75 to 90 per cent.

The results of treatment of 204 cases occurring in Porto Rico in patients between the ages of 2 and 67 years have been described by Suarez (Bull. Porto Rico Med. Assoc., May, 1927). All of 62 per cent. with positive skin reactions gave multiple reactions. Only 1 case was positive to only 1 substance or food. The Pirquet test was positive in 2 children; 2 had intestinal parasites. The blood calcium and the chemical reactions of the blood generally were normal in all cases. Tuna fish, silk and the pollen of Indian corn gave positive reactions in all the cases. Under treatment, 40 per cent. of the adults and 80 per cent. of the children treated were cured; 80 per cent. of all patients were markedly improved.

In 31 late hay fever subjects tested by G. T. Brown (Jour. of Immunol., Jan., 1927) with high and low ragweed pollens, all were equally sensitive to both extracts. One group received the usual series of prophylactic injections of 1 of the **extracts**, and the remainder were similarly treated with the other. After a maximal tolerance had been established to the 1 extract, an equivalent or larger quantity of the other extract was injected. This change from 1 extract to the other was not followed by a constitutional reaction in any case.

Experience has shown, according to Black (Jour. of Lab. and Clin. Med., Sept., 1927), that the **oral administration of pollen extract** offers a satisfactory means of securing protection against pollen, and is free of the objectionable features of hypodermic therapy.

A. Brown (Jour. of Immunol., Apr., 1927) modified the specific treatment by distributing the injections at 3 to 4

weeks' intervals, throughout the year, instead of the usual pre-seasonal injections at 5 to 7 day intervals.

In 19 cases of hay fever A. A. Thommen (N. Y. State Jour. of Med., Aug. 1, 1926) used **calcium injections**. Two preparations were employed: (1) A 5 per cent. solution of **calcium chloride** in doses of 5 to 10 c.c. (80 to 160 minims) and (2) a proprietary in the form of a 10 per cent. solution of **calcium urea**. Some cases were treated exclusively with 1 or the other solution. The majority, however, received injections of both. In all, 198 injections were administered, all being well borne. The injections were given biweekly in most cases; in others every day. One patient, who was considered a particularly good subject, received 2 injections daily for 4 successive days. No marked effects were observed in any case. Likewise, for controlling the paroxysm calcium proved entirely valueless.

Sternberg and Sugar (Wien. klin. Woch., Apr. 8, 1926) observed good results with 2 to 4 subcutaneous **injections** of 1 c.c. (16 minims) of a 5 per cent. solution of **sodium iodide**. Only the solutions containing traces of free iodine were active.

Hamburger (Münch. med. Woch., May 20, 1927) obtained favorable effects from 1-Gm. (15-grain) doses of **sodium bromide** twice daily, taken ½ hour before leaving the house.

Hutter (Wien. klin. Woch., June 3, 1926) states that **cauterization of the nasal mucosa** may sometimes prevent or alleviate attacks of hay fever, as held by laryngologists many years ago. Hamm (Klin. Woch., Mar. 19, 1927) obtained good results with **intranasal diathermy**.

The oral use of **ephedrine** in 25 to 60 mgm. (¾ to 1 grain) doses is stated by Gaarde and Maytum (Amer. Jour. Med. Sci., Nov., 1927) to have afforded temporary relief in 50 per

cent. of cases of autumnal hay fever. An additional 25 per cent. obtained sufficient relief to consider its use warranted. In a 3 per cent. solution as a nose spray, it is less efficacious and the relief is of shorter duration. However, the majority of patients felt that its use added to their comfort. The best results were obtained when the spray was used early in the paroxysm.

**HEADACHE.**—A comprehensive study showed, according to J. L. Halliday (Glasgow Med. Jour., Nov., 1926), that all headaches have certain features in common and that they are analogous to cases of referred pain, such as are found in conditions like appendicitis, biliary colic, and heart disease. Headaches differ from pain referred to the abdominal and thoracic walls only in the ease with which they are provoked. Both are the products of the same 2 variable factors: (1) An alteration in the equilibrium of the primary synapses, and (2) the overflowing of impulses from a neighboring neurone. The synapses of the spinal segments may be considered as comparatively stable and highly resistant, so that all but the most powerful visceral impulses are inhibited from entering the secondary pain tracts of the dorsal cutaneous nerves. On the other hand, the intramedullary synapses of the trigeminal and upper cervical nerves are relatively unstable and have a lower inhibitory power. In a few individuals, the easy loss of equilibrium in these primary synapses is the result of inheritance; in most individuals the natural instability is made manifest by slight abnormalities in the bodily activities. Headache is, therefore,

the commonest of human symptoms, as impulses from a variety of sources, cerebral as well as organic, can readily gain access to the pain tracts in connection with the scalp.

Although headache is one of the most common ailments of humanity, Leake, Loevenhart and Muehlberger (Jour. Amer. Med. Assoc., Apr. 2, 1927) note that surprisingly little experimental work has been devoted to its elucidation. An effort in this direction led them to conclude that dilatation of the blood-vessels noted after nitroglycerin suggests this vascular phenomenon as the underlying cause of the symptom. Not only are the nervous elements responsible for the sensation of pain, but they lie along the blood-vessels and not in the brain substance or the meninges. The cranial cavity contents is enclosed by rigid walls of bone, the skull, their fluid and semifluid materials being thus all subjected to more or less centripetal pressure. That such pressure does actually produce headache has been demonstrated by Cobb and Smith (1924). Tension is produced on the connective tissue coverings and the blood-vessel walls within the cavity sufficient to stimulate the sensory nerve-endings along the blood-vessels and thus cause headache. An experimental study in 16 anesthetized dogs illustrated graphically the changes of diameter provoked by nitroglycerin.

Morphologic changes, acute or chronic, of the *pituitary body* may cause headache by compressing the sensory nerves of the dura. The headache is often bitemporal or nuchal. J. Eidelsberg (Jour. Amer. Med. Assoc., Aug. 6, 1927), however, observed 27 cases of hypopituitarism, 12 of which suffered from headaches of great severity. Two of the patients

were women who had had these headaches at each menstrual period. Both were completely relieved by **pituitary** medication.

Referring to the headache observed *in children* during growth, Chauvet (Clinique, Apr., 1926) believes that a disturbance of the anterior pituitary function is responsible, while accounting also for certain anomalies of growth. He connects the disturbance of the anterior pituitary with an insufficient internal secretion on the part of the testicles, on the plea that the latter stimulates the pituitary secretion.

A review of the histories of 8500 private patients by E. C. Fishbaugh (Endocrinol., Sept.-Oct., 1927) disclosed 47 suffering from menstrual headaches; of these, 15, whose cases were uncomplicated and who were relieved by treatment of ovarian dysfunction, are reported. The author concludes that there is a type of headache associated with *ovarian dysfunction*. It is not itself characteristic, nor does it differ from headaches due to other causes. It is associated with nervous symptoms and other features of ovarian insufficiency. Relief from these headaches is obtained by correction of the ovarian dysfunction. The author describes 2 cases relieved by the production of an **artificial menopause** and 10 in which **ovarian gland** was administered. Correct diagnosis is essential if results are to be obtained by **ovarian feeding**, *i.e.*, 10 to 15 grains (0.65 to 1 Gm.) of ovarian desiccated gland after each meal, and if needed, injections.

According to C. B. Craig (Amer. Jour. of Syph., Apr., 1927), in the presence of persistent or recurrent headache with or without other symptoms, *syphilitic* organic disease of the

central nervous system may be suspected until disproved.

Evidence is presented by Atkinson (Brit. Med. Jour., Aug. 13, 1927) to the effect that more cases of headache are due to *nasal disease* than is generally realized.

**TREATMENT.**—Peritz (Med. Klin., Aug. 5, 1927) discusses the rôle of the nervous system in headaches and in the origin of myalgias. The severity of a headache depends on the resistance in the nervous system. As the chief causes of functional headache, overwork and fatigue are mentioned. Other causes are: Anemia, gout, endocrin disturbances, obesity, infections (influenza), intoxications (alcoholic beverages), and reflex pains (disturbances of vision). The treatment varies with the cause, but general measures will be needed in most cases. **Massage, high frequency current, application of heat, use of certain drugs, and, finally, injection of sodium chloride solutions** into the myalgic regions may be helpful. Applications of heat are contraindicated in persons with high blood-pressure. **Partial arm baths** (Schwenninger) are often helpful. In cases in which headache is due to prolonged overwork, infections, or mild constitutional disturbances, **injections of saline solution** produce lasting results. In anemic persons, **rest, fresh air and arsenic** preparations are indicated. When in nervous persons excitability is great, patients must be calmed and strengthened before any special treatment for headache is applied. In many cases it will suffice to eliminate the hyperexcitability of the nervous system. **Psychotherapy** is often helpful.

Penfield (Surg., Gyn. and Obst.,

Dec., 1927) refers to 7 patients suffering from *chronic meningeal headache* of post-traumatic origin in which dizziness and headaches (except in 1 case) were relieved completely by **lumbar air insufflation**. The amount of air injected varied from 42 to 95 c.c. The immediate reactionary headache lasted from 3 or 4 up to 9 days after insufflation. Kovats (Med. Klin., June 11, 1926) injects small doses (0.15 to 0.02 mgm— $\frac{1}{425}$  to  $\frac{1}{3250}$  grain) of **epinephrine** in *tuberculous* patients complaining of headaches.

**HEART.—DIAGNOSIS.**—The *early signs and symptoms* of heart disease were studied by Coffen (Northw. Med., Feb., 1928) in about 1000 records. They appeared in the following order: Dyspnea, 70.1 per cent.; palpitation, 62.6 per cent.; heart pain, 36.2 per cent.; digestive disturbances, 24.2 per cent.; respiratory symptoms and signs, 22.6 per cent.; weakness, 19.9 per cent.; vertigo, 34.4 per cent.; enlarged heart, 57.3 per cent.; enlarged liver, 19.2 per cent.; edema, 17.7 per cent.; extrasystoles, 43.5 per cent.

**Bradycardia**, not physiologic, was observed by Lund (Ugeskr. f. Læger, Mar. 11, 1926) in 28 to 65 per cent. of 151 cases of otogenous sepsis, brain abscess, meningitis or encephalitis. The mortality was 81 per cent. among the 65 cases of bradycardia, while it was only 32 per cent. in the 86 cases in which the pulse corresponded to the temperature. The highest degree of bradycardia was noted with an abscess in the brain. The unilateral localized pressure from an otogenous cerebral abscess is one of the important factors of the bradycardia.

**Clubbed fingers**, when pronounced, were observed by Czyhlarz (Wien. klin. Woch., July 22, 1926) chiefly in aortic insufficiency of endocarditic origin of long standing, but not in other valvular diseases. The more



strongly pulsating blood-flow in the capillaries may promote the enlargement of the fingers, which are also usually longer.

**Cardiac Pain.**—Singer and Spiegel (Zeit. f. d. ges. exp. Med., June 4, 1927) traced, in dogs, the path of painful stimuli from the heart and aorta over the stellate ganglia to the posterior roots of the 8th cervical and the 1st 4 thoracic segments. Considerable hyperesthesia could be obtained, even when some of these roots remained intact.

In 100 cases in which the chief complaint was pain around the heart, R. W. Baird (Tex. State Jour. of Med., Apr., 1926) found that it was caused in most instances by myocardial weakness (42 cases). Cardiac neurosis and hypertension each caused pain in 17 cases; angina pectoris, in 15 cases; chronic endocarditis, in 7 cases, and aortitis, in 2 cases. W. Gordon (Brit. Med. Jour., Apr. 23, 1927) observed 8 cases of severe heart pain in the course of epidemic toxemia.

In 5 cases of chronic rheumatic valvular disease in young adults the predominant symptom was found by S. P. Schwartz (Amer. Heart Jour., June, 1927) to be severe paroxysmal cardiac pain. The attacks were usually nocturnal and accompanied by increased pulse-rate and respirations, marked rises in blood-pressure, violent pulsations of the vessels of the neck, severe headache and variable vasomotor phenomena. The onset of these attacks was always during an afebrile period, and occurred from 1 to 12 years after the first signs of rheumatic fever. The cardiac pain recurred in from 9 months to 1 year in 4 patients. In a fatal case it was noted 1 month prior to death. Four of the 5 patients are living.

**Abdominal Symptoms.**—Wedd (Surg., Gyn. and Obst., Dec., 1927) calls attention to the fact that the abdominal symptoms of heart disease often cause patients to apply to the surgeon. The cardiac symptoms may be purely reflex, such as the abdominal pain, nausea and vomiting seen in coronary disease or acute inflammations of the heart. There are also secondary changes in the abdominal viscera which may be responsible for the symptoms, *viz.*, acute or chronic passive congestion of the liver and portal stasis. They occur frequently as a result of

auricular fibrillation, and the impairment of the circulation dependent on the arrhythmia itself offers a ready explanation. Abdominal symptoms resulting from infarction of the spleen and perisplenitis occurring in subacute bacterial endocarditis have been observed, and 3 cases in which laparotomy was performed have been recorded. Patients suffering from cardiovascular disease may develop any known abdominal disease, but because of the frequency and variability of abdominal symptoms in purely cardiac cases the burden of proof is on the recognition in the abdomen of an independent pathologic process.

**DECOMPENSATION.**—In 35 patients with severe cardiac decompensation seen by J. Meyer and T. F. Mullen (Amer. Heart Jour., Feb., 1928), the treatment received was rest in bed, digitalis and opium when indicated. In 16, the systolic blood-pressure fell 10 to 40 mm. as compensation became established. Of these, 15 were improved and discharged, death occurring in but 1 patient in whom the blood-pressure fell. In 12 patients the pressure remained unchanged. Of these, 9 improved and were discharged, and 3 died. In 5 patients, the blood-pressure was increased as compensation occurred; of these, 3 died and the remaining 2 were improved.

In 2 instances observed, there was a definite fall in blood-pressure as compensation occurred, but the pressure rose to that on admission before the patient left the hospital. The authors observed this fall in cases of aortic regurgitation, mitral regurgitation, chronic myocarditis, emphysema, and chronic nephritis.

H. Assmann (Münch. med. Woch., Sept. 23, 1927) observed a characteristic sweetish slightly aromatic odor of the breath, resembling somewhat that of unboiled milk, in cases with severe decompensation.

**HEART MURMURS.**—A painstaking study of *apical heart murmurs* in 1050 unselected patients by P. D. White (Amer. Jour. Med. Sci., Dec., 1927) showed that organic heart disease was present in 797, or 76 per cent. In 50 cases, the murmur was transmitted from the base; 63 cases were doubtful, and in only 190 (or 18 per cent.), the heart was not the seat of organic disease. The louder the murmur, the greater is the probability of organic heart disease and the worse the prognosis. Valvular disease, cardiac dilatation, or both, appear to be responsible for the bulk of apical systolic murmurs in this group. An analysis of 250 consecutive patients with mitral diastolic murmurs showed that true mitral stenosis is probably present in about 90 per cent., the balance being due to left ventricular dilatation associated with aortic regurgitation or other condition. Transmission of an aortic diastolic murmur to the apex occurred in about 37 per cent. of the cases showing such murmurs. Organic heart disease (including angina pectoris) is frequently found without apical systolic or diastolic murmurs, as shown by 492 (or 36 per cent.) of a series of 1359 cases of organic heart disease, and also quite often without heart murmurs at all, as shown by 421 (or 31 per cent.) of these same 1359 cases.

*Functional systolic murmurs* are most frequent in neurasthenic persons, according to Treguboff (Klin. Medit., Jan., 1927). They are associated with other signs of cardiac neurosis, as palpitations, pain in the cardiac region and dyspnea. His experiments on isolated animal hearts showed that hyperexcitability of vagal fibers in-

nervating the papillary muscles is responsible for the functional murmurs. The theory was verified in epinephrine and atropine tests in patients with cardiac neurosis. Under the influence of epinephrine, the intensity of the systolic murmurs increased; under atropine, the murmurs disappeared. These results were independent of the blood-pressure. Hypertension of the chordæ tendineæ, due to spastic contraction of the papillary muscles, causes insufficiency of the valves. Hence the murmurs. Atropine appeared to be without influence on systolic murmurs of organic origin.

*Gallop rhythm*, observed by Conner (Amer. Heart Jour., June, 1927) in 10 cases, consists of a great exaggeration of the ordinary form of early diastolic gallop, in which the gallop sound is so loud and the corresponding palpable shock so strong that it dominates completely the cardiac signs. It is much louder than either of the 2 heart sounds which immediately precede it, and is sharp and short; the shock is correspondingly sharp and quick, and is readily appreciable to the eye as a quick outward rebound of a circumscribed area of the chest wall over the intercostal space where it occurs. The most striking examples have been found in patients with advanced mitral disease who have entered the hospital in a state of extreme congestive heart failure, with orthopnea, cyanosis, dropsy, and pulsating liver and neck veins. Of the 10 cases seen, 4 were of this sort. In 4 other cases the gallop appeared in patients with severe rheumatic fever and some valvular injury, but without severe heart failure. The 9th case was associated

with coronary thrombosis and the 10th, with essential hypertension.

**ELECTROCARDIOGRAPHY.**—The greatest service so far rendered by the electrocardiograph, in the opinion of I. Shattenshtein (Klin. Medit., Oct., 1927), has been to enable the clinician to differentiate and localize various types of arrhythmia. It aids in the diagnosis of organic disease of the heart muscle, and is the only means of recognition of lesions affecting the deeper portions of the conduction apparatus. It affords important information as regards the prognosis of cardiac disease, and is valuable in the control of therapeutic effects.

Immediately after birth, Doxiades (Klin. Woch., Feb. 19, 1926) obtained electrocardiograms from 10 normal infants. The P and T waves were absent during the initial apnea, and the R was inverted. With the beginning of respiration, a rapidly increasing R and T wave appeared.

Lian and Petit (Presse méd., Mar. 20, 1926) observed cases of *recurring syncope* without alteration of the heart rhythm, or with only slightly retarded heart beat, in which electrocardiograms revealed block of the right branch of the bundle of His, thus explaining the tendency to syncopes. One of the patients soon died; another developed a lesion of the bundle of His. In 2 cases the functional derangement subsided and the improvement has persisted for 2½ years. By adapting itself to the auriculoventricular dissociation the heart may, however, correct the tendency to syncopes for a long while.

According to Hepburn and Jamieson (Amer. Heart Jour., June, 1926), signs of *bundle-branch block* appear to be the most serious electrocardiographic abnormality. The presence of ventricular extrasystoles does not appear to increase the mortality in auricular fibrillation. Negative T waves in various combinations of Leads I, II and III, other than in Lead III alone, warrant a grave prognosis.

**PATHOGENESIS.**—The reasons for the increasing mortality from heart disease were studied by H. Albert (Trans. Amer. Med. Assoc., May, 1927). In 1900, there were 132

deaths from heart disease per 100,000 of population in the registration area of the United States; in 1925, 185.5. The reasons for this increase are given by the author as follows: (1) Strenuous life; (2) increase in average length of life, causing more persons than ever before to reach "heart disease" age; (3) reduction in the mortality from tuberculosis and other diseases. He adds to these causes the fact that there is living at the present time a larger proportion of the population which has been maimed by certain infectious diseases than there was 10 or 20 years ago. This is especially true for scarlet fever.

In the opinion of R. W. Scott (Ann. of Clin. Med., May, 1927), *latent syphilis* is an important cause of death from heart failure only when it attacks the root of the aorta, leading to aortic regurgitation or coronary occlusion, or both. The disease may be clinically silent and continue as a chronic inflammation in the aorta for as long as 44 years. In early cases, syphilis involves primarily the vasa vasorum of the adventitia—obliterative endarteritis with perivascular infiltration. The changes in the media appear to be secondary. Syphilis spreads from the aortic root to the valves by way of small vessels at the commissures. The lateral margins of the leaflets gradually become adherent to the adjacent intima, producing the ultimate picture of a widened commissure—the earliest and most characteristic evidence of syphilitic involvement of the aortic valves. Free aortic regurgitation developing insidiously in an adult with a negative cardiac history and without evidence of acute infection is best regarded as syphilitic until proved

otherwise. A negative Wassermann reaction does not eliminate syphilis, as 15 per cent. in the writer's series gave a negative reaction. Syphilis at the root of the aorta is, in the majority of instances, a progressive lesion, and imposes a burden on the heart leading ultimately to death.

**TREATMENT.**—Discussing cardiac disturbances due to *thyroid disease*, J. Marion Read (Jour. Amer. Med. Assoc., Aug. 13, 1927) states that reduction of the basal metabolic rate due to hyperthyroidism is the therapeutic desideratum if the heart is to be saved from overwork and ultimate exhaustion. **Rest** is a *sine qua non* in addition to any other measure employed. The indications comprise, to relieve the heart of overstrain, the moderate use of fluids, the tapping of transudates into serous cavities, and other established therapeutic measures. When auricular fibrillation exists without evidence of congestive failure, **quinidine** is the drug of choice, its use being safeguarded by the usual precautions. Quinidine seems to be of considerable value in treating the cardiac manifestations of hyperthyroidism.

In *arrhythmia*, Eismayer (Deut. Arch. f. klin. Med., Aug., 1927) found that the irregular action was eliminated in about 25 per cent. of his cases for a few months by **quinidine**. Its use, however, entails serious dangers, such as embolism, sudden arrest of the heart, and aggravation of the heart disorder present. It should not be used, therefore, in cases in which compensation has not been obtained with **digitalis**. Patients using quinidine should be kept in bed and be under continual observation. After regulation is begun, the

conduction time can be determined by means of the electrocardiograph. When the P-R interval becomes greatly lengthened, or severe by-effects, such as collapse or Adams-Stokes attacks, appear, the remedy should be discontinued. Before quinidine is definitely used, a test dose should be given, and if there are symptoms of hypersensitiveness it should not be given. In view of its dangers, quinidine treatment should not be used in general practice, but in hospitals.

C. W. Barrier, Jr. (Trans. Amer. Med. Assoc., May, 1927) recalls that **quinidine** has a place in the treatment of extrasystole, auricular and ventricular tachycardia, flutter and fibrillation, but that organic disorders tending towards heart failure are prime contraindications. In a case of prolonged paroxysmal ventricular tachycardia, quinidine failed when given orally; the patient, however, responded when the drug was given by vein. Fast sinus rhythm, as well as other undesirable rhythms, may follow quinidine in auricular fibrillation after digitalis has produced a satisfactory pulse.

In *childhood and infants*, Abt (Ill. Med. Jour., Aug., 1926) found external application of **mustard** to be a valuable measure for the *heart failure* that occurs in pneumonia and nutritional disturbances, or in any condition in which heart failure is threatening or impending. **Rest** and **sleep** are also important factors. Excessive manipulation and treatment should be dispensed with. The surroundings should be kept quiet. Anxious friends should be enjoined from disturbing the rest and quiet of the patient. Sometimes a moderate dose of **cam-**



phorated tincture of opium in infants or an appropriate dose of **codeine** or **morphine** in an older child will do more to relieve circulatory failure than all other medication that may be employed. It may be a life-saving measure. [The danger of opiates in the newborn and infants should not be overlooked, however.]

In 8 cardiac patients suffering from attacks of severe *precordial pain*, Swetlow (Amer. Heart Jour., Apr., 1926) used **paravertebral alcohol injections** of the dorsal root ganglia. Prompt and satisfactory relief from pain was secured in every instance. It followed a single injection that lasted several months. In 1 patient, who was reinjected after 4 months of relief, there has been a 2d period of comfort lasting several months. No complications nor serious after-effects were encountered.

P. D. White (Arch. of Int. Med., Jan., 1928) analyzed 100 patients with *gallop rhythm*. It is generally a bad prognostic sign, almost  $\frac{1}{2}$  of the 100 patients having died within 2 years of its discovery, and 32 of these within 6 months. Of the remaining 55 patients many were seriously ill or dead when last heard from. It occurred in both young and old, 48 per cent. of the patients being between 50 and 70. Coronary disease, alone or in combination, was apparently present in 54 per cent., actual coronary thrombosis being diagnosed in 21 per cent. Hypertension, alone or complicated, was present in 49 per cent.; syphilitic aortic, in 13 per cent.; rheumatic heart disease, in 12 per cent.; nephritis, in 12; uremia, in 10; effort syndrome alone, in 3; pericarditis, in 3; subacute bacterial endocarditis, in 2; congenital heart dis-

ease, in 1, and unknown factors, in 5. Congestive failure was the most outstanding characteristic, being present in at least 61 per cent. Angina pectoris occurred in 25 per cent., and cardiac asthma in 14 cases. The heart rate was usually rapid, averaging about 100. At least  $\frac{3}{4}$  of the cases showed rates between 80 and 120. The blood-pressure was variable, the systolic being between 100 and 150 mm. Hg in 43 per cent., between 150 and 200 in 35 cases, over 200 in 19, and under 100 in 3. Pulsus alternans was found in 21 per cent. The heart was considerably enlarged in 60 per cent., definitely normal in size in only 6, and doubtful in 18. The heart sounds were poor in 52 per cent. of the cases, and good in only 14. Valvular disease was uncommon, aortic regurgitation being found alone in 15 cases, mitral stenosis alone in 4, and the 2 conditions combined in 4. Apical systolic murmurs, however, were common; loud in 12, and slight to moderate in 33. There were no heart murmurs in 32 cases. Electrocardiograms were obtained in 64 of the patients. Only 2 of these were normal. Digitalis as a possible factor in the production of gallop rhythm was negligible. Indeed, in some cases it disappeared coincidentally with the clinical improvement following **rest** and the administration of **digitalis**.

Dunn (Lancet, Jan. 15, 1927) used **gentian violet** intravenously in 7 out of 10 cases of *rheumatic carditis*. He injected 25 to 50 c.c. of a 0.25 per cent. solution, *i.e.*, 5 mgm. per kilo. of body weight. Of the 10 cases, 8 were definitely improved, 1 uninfluenced, while 1 case did not receive a fair trial. Gentian violet opens a

more hopeful future in the treatment of blood infections.

Bardier and Stillmunkes (C. r. Soc. de biol., Apr. 26, 1927) found that **quinine** or **quinidine** administered previous to *chloroform anesthesia* averted cardiac syncope. They attribute this result to the mutual antagonism of the substances. While epinephrine, as a vasoconstrictor, favors the appearance of cardiac fibrillation, quinidine, as a vasodilator, prevents fibrillation. The effects of quinidine proved experimentally to be at least 10 times more powerful than those of quinine. Animals were injected with quinidine and then exposed to prolonged chloroform anesthesia. Reanimation of the heart was obtained by means of **epinephrine**, without provoking an epinephrine-chloroform syncope. Quinidine not only creates a condition opposed to the development of cardiac syncope, but it also favors reanimation by **epinephrine** when syncope has developed.

Thorne (Practitioner, July, 1926) states that in cases of *dilated hearts in children*, the sequelæ of myocarditis, endocarditis, or pericarditis resulting from rheumatic or other infection, a course of **Nauheim baths** will restore the patient to health much more rapidly, certainly and surely than any other measure.

**HEART-FAILURE.**—J. H. Clark (Jour. Amer. Med. Assoc., July 2, 1927), on the basis of clinical experience, warns that when large amounts of fluid are to be administered, *intravenous therapy* by means of drugs is not the innocuous procedure it is generally considered. He illustrates by 4 fatal cases the necessity of carefully choosing patients for the procedure. If the injection is given

slowly and a careful watch is kept of the pulse and cardiac condition, with frequent blood-pressure determinations made during the injection, such fatalities should be preventable by avoiding acute cardiac dilatation.

In the treatment of cardiac failure E. C. Cornwall (Med. Jour. and Rec., June 16, 1926) sustains the teaching of Mackenzie that laboratory experimentation, especially on animals, cannot altogether be trusted because pathologic changes in the human organism can modify the effects of the drug and often discredit inferences from such experimentation. Clinical experience must largely determine practical uses. On the basis of prolonged clinical experience he concludes that in uncompensated valvular disease with unfavorable prognosis **strophanthus** is preferable to **digitalis**. This applies also to *cardiac dilatation* from any cause.

H. M. Marvin (Jour. of Clin. Invest., Feb. 20, 1927) holds that the use of **digitalis** in suitable large doses, properly controlled, in patients with advanced congestive heart-failure, regular rhythm and considerable edema, appears to cause improvement consistently in only 1 group, that due to arteriosclerotic cardiac disorders, frequently referred to as "*chronic myocarditis*" or "myocardial insufficiency." It has been found occasionally beneficial in patients with *syphilitic heart disease*, but almost devoid of effect in rheumatic heart disease. The same differences have been noted with regard to the effectiveness of **diuretic drugs** administered after complete digitalization.

Cases of rheumatic heart disease infrequently show satisfactory diuresis, while those with arteriosclerotic heart disease, as a rule, respond in a highly favorable manner.

The influence of digitalis in the heart-failure of *children* was demonstrated in 2 infants observed by Rothman and Leonard (Amer. Jour. Dis. of Childr., Jan., 1928). One was 14 months old and the other 16 months. There was no evidence pointing to either a rheumatic or diphtheritic etiology. Their illnesses were of short duration, and on admission they were suffering from myocardial decompensation. Their hearts were tremendously enlarged, and the roentgenograms were similar to those in cases of idiopathic hypertrophy of the heart. Digitalis was administered, and was followed by prompt improvement.

In the course of a study of the effects of **adrenalin injections** in cardiac failure, M. Petzetakis (Arch. des mal. du cœur, Aug., 1926) used freshly prepared and standardized adrenalin solution in a number of normal individuals between the ages of 20 and 35 years. Intravenous injections of 1 c.c. (16 minims) of a solution weaker than 1:60,000 caused no objective disturbance, but this solution, and others up to 1:20,000, usually caused pallor and palpitation, which increased in severity as the solutions injected were made stronger. With an intravenous dose of 1 c.c. of 1:4000, every subject complained of dyspnea and violent palpitation, while the face became pale and syncope appeared imminent. When the strength was increased to 1:1000, syncope, necessitating injection of a cardiac tonic, occurred. Injection of 1 c.c. of solutions of from 1:200,000 to 1:60,000 produced a very brief fall in systolic pressure, followed quite frequently by a variable degree of hypertension. When these doses were increased to 1:8000, there was an initial rise of blood-pressure, becoming shorter as the dose was increased and followed by a definite fall.

Large doses of adrenalin produce definite sinus or nodal arrhythmia,

due to stimulation of the sympathetic or of the intracardiac centers. Adrenalin induces syncope only when excessive doses are injected. In patients anesthetized by chloroform it is particularly necessary to exercise great caution in the injection of adrenalin, since chloroform produces vagal irritability. The author does not condemn intracardiac injection of adrenalin in *syncope*, but calls attention to the danger of large doses; in no case should 0.25 mgm. ( $\frac{1}{250}$  grain) be exceeded. He advises great caution in the use of adrenalin in the Stokes-Adams syndrome. It is cumulative; a moderate dose can be repeated at intervals when required.

### HEAT AND HELIOTHERAPY.

**APY.**—According to C. E. de M. Sajous (Med. Jour. and Rec., Sept. 15, 1926), the therapeutic effects of heat or light in any of its forms, including heliotherapy and to a certain extent the roentgen rays, are due to their accelerating influence on the physiologic process of heat production. This process, according to the author, is carried out by the reaction between the adrenoxidase, an oxidizing enzyme (of which epinephrine or adrenalin is the active principle), and lecithin, a product of the adrenal cortex, rich in phosphorus, both present in all tissues. The heat energy liberated by the reaction of these 2 products serves to raise the proteolytic activity of enzymes which are also present in the tissue cells, thus enabling them to break down or digest pathogenic germs, their toxins or toxic waste products of metabolism, and to antagonize any disease any of them may produce. Heat or light therapy thus *provokes an artificial local fever*, emulating thereby Nature's own way of counteracting infection. Any form of heat, from the hot-water bottle to the sun, thus becomes a therapeutic agent.

Excessive fever (hyperpyrexia) as represented by a body temperature exceeding 105° F. (40.5° C.) is harmful, however, by endowing the proteolytic cellular enzymes (trypsin) with excessive digestive activity. The blood cells and even the tissues may thus be themselves digested (hemolysis or autolysis), causing either profound anemia,

valvular diseases of the heart, endocarditis, arthritis, or other disorders and even death. The therapeutic use of heat or light radiation is similarly beneficial up to a certain limit, but harmful when carried beyond it.

**HEMATURIA.**—Van Dusen (Tex. State Jour. of Med., Jan., 1928) studied the sources of bleeding in 500 recorded cases of hematuria and reached the following results: Urethra, 38 cases; prostate, 57; bladder, 82; ureter, 72 and kidney, 172. In 2 cases it resulted from the use of a proprietary cough lozenge containing chloroform, capsicum, cubeb and menthol. The urine contained many flakes of necrotic tissue and bright red blood. Lime liniment (carron oil) was the causative agent in 1 case, and turpentine in another. The cystoscopic appearance of the bladder in the last 2 cases showed intense injection of the mucosa with many areas of submucous hemorrhage. Pregnancy existed in 42 cases; focal infection, in 28; syphilis, in 12, and pernicious anemia, in 7. Of the whole series, 319 patients received treatments other than medical.

**HEMOPHILIA.**—The relation of this symptom to heredity has received considerable attention. Macklin (Amer. Jour. Med. Sci., Feb., 1928) holds that a man with hemophilia will not have children showing this disease, provided he marries a normal woman who is not a carrier. Not only will the sons of such a man be normal themselves, but they cannot transmit the defect to their descendants. The daughters of such a man will be outwardly normal, but they will all be carriers of the defect, liable to give it as an evident disease to  $\frac{1}{2}$  their sons. Half the daughters

of a woman who is a carrier of hemophilia are apt to be carriers themselves, transmitting the defect, as their mothers did, to  $\frac{1}{2}$  their sons as an evident defect, and to  $\frac{1}{2}$  their daughters, who will be carriers in their turn. Half the daughters and  $\frac{1}{2}$  the sons of a woman who is a carrier are apt to be normal. Theoretically it is possible for a woman to show hemophilia as a disease, provided she had a father who showed the disease and a mother who was either a carrier or hemophilic herself. If there were a woman with hemophilia, all her sons would exhibit the disease. The only persons in a hemophilic family who can marry with impunity are the unaffected males and their descendants. All daughters of hemophilic males are carriers and should not bear offspring.

Conversely, Klug (Deut. Zeit. f. Chir., Nov., 1926) recalls that among 52 families descended from the Mampel bleeder family, hemophilia exists in only 12. The writer modifies Lossen's figures. He found but 1 true bleeder marriage (marriage between bleeder and transmitter). In 100 years hemophilia never appeared in the females of this family nor has been transmitted by males or from a grandmother directly to a grandson. As to transmission by males, the most of the bleeders died too young to have progeny. In his statistics, the males show 27 bleeders and 39 non-bleeders; among the 58 females were 14 transmitters and 10 non-transmitters; the rest of the bleeder branches of the family either died young or are childless up to the present time. The presence of non-transmitting females in this family goes far to prove the validity of Men-



del's law for hemophilia. In keeping with earlier conclusions, Bauer and Wehefritz (Arch. f. Gyn., June 19, 1926) assert that there is no evidence to show that true hemophilia is ever observed in women. In a new family tree described, there were bleeders in each of 4 generations, from 1 to 6 of the men being bleeders but none of the women, and only 5 of the men escaping. They conclude that to date we must accept hemophilia as a sex-bound recessive factor.

The above contradictory interpretations probably indicate that, as Willebrand (Finska Läk. Handl., Feb., 1926) suggests, there occurs, besides true hemophilia, what he terms a *pseudohemophilia*. In a family described, there were 23 bleeders in the 66 members of 4 generations. The coagulation time was normal, but the bleeding time was extremely long in the grave cases, and the Rumpel-Leede phenomenon was pronounced. The clinical picture resembled that of Weil's disease, suggesting some functional disturbance in the thrombocytes plus a general lesion of the vessel walls. The thrombocytes numbered 55,000 to 450,000. The eosinophiles ranged from 1 to 14 per cent.; the lymphocytes, from 25.3 to 61.3 per cent., and the neutrophils, from 35 to 65.4 per cent. The graver forms were in women and proved fatal in 5. None of the male members died from this cause. Transmission seemed to be in the female line.

**PATHOLOGY.**—Christie (Quart. Jour. of Med., July, 1927) obtained what he believes a true index of the condition. He accomplished this by taking the coagulation time of successive drops of blood from a single

stab wound, this serving as an index of the tissue reaction and platelet reaction. In hemophilia there is a characteristic curve, indicating a deficiency in the coagulative elements of the blood and also of the platelet reaction. Severe purpura and jaundice also gave a characteristic curve, indicating deficiency of the platelet reaction. He describes 3 cases in which, although there was a definite hemorrhagic history, the coagulation time was normal. The coagulation curve in these cases was definitely pathologic. Frank and Hartmann (Klin. Woch., Mar. 5, 1927) found, however, that the action of blood platelets is the same in normal and in hemophilic subjects. Differences were, he thought, due only to the absorption of blood plasma, and these disappeared after repeated washing of the platelets. The blood in hemophilia contains substances which inhibit the change of proserozyme into serozyme. Thrombin forms from the latter in the presence of calcium by the action of kinase contained in blood platelets. Injections of **normal whole blood** or of **normal blood plasma**, from which the proserozyme has been removed by treatment with **tricalcium phosphate**, restore the normal coagulability of the blood temporarily.

**TREATMENT.**—On account of the familiar fact that hemophilia skips the female link in its transmission, Samson-Himmelstjerna (Svenska Läk. Handl., Dec. 31, 1925) utilized in treatment the female sex hormone, especially in view of the periodicity of the tendency to bleed during menses. Everything points, he thinks, to the fact that hemophilia is due to the occasional or periodic formation of a substance which damages the vessels.

**Ovarian extract** (from cows), **heliotherapy**, and **shock treatment** form a 3-fold mode of attacking hemophilia.

In a grave case of *pseudohemophilia*, Goia (Bull. Soc. mém. des hôp. de Paris, Mar. 26, 1926) used the **roentgen rays** with favorable result. The rays were applied to the spleen for 15 minutes, and the bleeding from the nose and gums stopped the same day. The bleeding time at the right ear dropped from 105 to 35 minutes; at the left ear, from 10 to 5 minutes. The general condition was notably improved by the 4th day; the ecchymoses and petechiæ tended to disappear, and the bleeding time at each ear was 3 minutes. The patient recovered completely in 10 days. Examination of the blood showed only a few blood platelets. This seems to prove that not thrombopenia, but other factors, are responsible for the condition, especially endothelial lesions of the vessels.

Christie and Gulland (Quart. Jour. of Med., July, 1927) conclude, after trying many methods, that the most efficient local coagulant is **fresh human blood** from a normal human subject soaked in cotton wool and applied after removal of all useless clots. **Antiplaquet serum**, **intravenous calcium chloride**, and **thymus nucleic acid** internally are suggested as being worthy of a trial in the treatment.

Trauner (Wien. klin. Woch., June 6, 1927) found that thorough **colonic lavage** may stop dangerous hemorrhages *after extraction of teeth* in bleeders.

**HEMORRHAGE.**—Stofer (Ann. of Int. Med., Oct., 1927) found **transfusion** to be the most

successful means of combatting severe hemorrhage or shock, *pre-operative* or *post-operative*. In chronic secondary anemic patients it improves the patient and reduces operative risk.

Mertz (Zeit. f. Geb. u. Gyn., Jan. 13, 1928) obtained temporary success by **X-ray applications to the spleen** in *gynecologic* hemorrhages of functional nature, but not in those of accidental nature. Blood coagulation after irradiation of the spleen is due to the increased cell destruction, with increase of the products of protein decomposition in the blood.

Hurd (Arch. of Otolaryng., Nov., 1927) found that a piece of **salt pork**, 1½ inches (4 cm.) long and as large as the naris will admit, pushed into the nose until the outer end is well within the nasal vestibule, is useful in epistaxis. Usually no outside dressing is employed to hold the pork in place; it will slip out in a few hours and there is no more bleeding. He has had it remain in the nose as long as 3 days and be as clean when removed as it was when introduced.

**HEMORRHOIDS.**—According to Fee (Ohio State Med. Jour., Oct., 1927), over 75 per cent. of patients suffering from anorectal diseases can be treated in the office or outpatient clinic. Local anesthesia can be successfully used in all of the 75 per cent., and in a majority of the remaining 25 per cent. which would require hospitalization. The **injection treatment** for uncomplicated internal hemorrhoids is said to be safe and efficient in skilled hands.

Boas (Deut. med. Woch., Mar. 25, 1927) aspirates internal hemorrhoids with Bier's pump and injects 0.5 to 2 c.c. (8 to 32 minims) of **absolute**

alcohol into the varicosities, employing local anesthesia obtained by rectal injection of 50 c.c. (1 $\frac{2}{3}$  ounces) of a 0.5 per cent. solution of **procaine hydrochloride** with **epinephrine**. The injected nodes are replaced immediately. In external hemorrhoids the treatment is usually followed by gangrene and the healing takes from 8 to 10 days.

**HERNIA.**—D. Paterson and G. M. Gray (Arch. of Dis. in Childh., Dec., 1927) found 1018 cases of hernia of various kinds among 130,243 *children* outpatients—an incidence of 0.8 per cent. There were 773 simple inguinal hernias; operations were performed in 564, with 4 recurrences. Among the 209 cases in which operation was not performed, the hernia had apparently spontaneously disappeared in 185, while in 24 it was still present. The chances of spontaneous disappearance of an inguinal hernia would appear to be better in females than in males. There were only 8 cases of strangulated hernia in the whole series, and no case of femoral hernia was found.

**INGUINAL.**—Inguinal hernia of the cecum in a man of 56, who had had a right inguinal hernia since the age of 25, was observed by Razemon and Dupire (Echo méd. du Nord, Feb. 18, 1928). It had begun to show symptoms at 40. When the hernial sac, about the size of a large hen's egg, was opened, it was found to contain part of the cecum, the appendix, and several centimeters of ileum. **Cecoplication, cecopexy, resection of the sac** and repair of the wall were done and the results of the operation were normal. The patient no longer had diarrhea. At X-ray examination

8 days later, digestion was found to be completed a little sooner than is normal. This was due to the fact that Bauhin's valve was completely incontinent. The authors consider this to be a consequence of the incorrect position of the ileocecal loop for many years.

Feldmann (Zent. f. Chir., July 24, 1926) warns that in elderly men inguinal hernia may be a symptom of increase of abdominal pressure from cancer of the large intestine, in hypertrophy of the prostate, stricture of a ureter, or chronic bronchitis with continuous coughing. In infants, phimosis or whooping-cough is often the origin of inguinal hernia. It is useless to operate on the hernia while the cause remains.

**INTRA-ABDOMINAL.**—Sudden generalized abdominal pain accompanied by nausea and vomiting, followed by a similar attack 4 months later, was observed by Elston (Jour. Ind. State Med. Assoc., Apr., 1926) in a girl of 16. There was abdominal tenderness, with slight rigidity and tympanites. Operation revealed a small, evidently congenital aperture in the root of the mesentery, hard and ring-like, about the size of a lead pencil. The bowel herniated through it was about 76 inches (193 cm.) long and gangrenous. The herniated bowel was resected and an end-to-end anastomosis done with a button, recovered on the 9th day. The patient left the hospital in apparent good health.

**UMBILICAL.**—Vogeler (Zent. f. Chir., Mar. 13, 1926) differentiates between congenital hernias of the umbilical cord according to their contents. Only 2 survived out of 10 children with prolapse of the liver treated at Bier's clinic. The reposi-

tion of the liver increases the abdominal pressure and interferes with breathing and the action of the heart. He advises to **resect** or **ligate** the part which cannot easily be pushed back into the abdominal cavity.

The low skin sensibility in umbilical hernia is due, according to Stahnke (Beitr. z. klin. Chir., cxxxvi, 38, 1926), to degeneration of the axis cylinder in the nerves of the skin covering the hernias. If the myelin sheath degenerates, the anesthesia is complete.

**OPERATIVE BLUNDERS AND MISHAPS.**—Many such seem to occur in the surgery of hernias. Lipscher (Zent. f. Chir., Feb., 1927) encountered what he regards as a dangerous feature. While operating on a small, right inguinal hernia in a boy aged 10, he included a portion of intestinal wall in the clamp with the sac and sutured it to the lateral abdominal wall in the region of the internal inguinal ring. The error was discovered at a second operation 4 days later. The abdominal cavity contained 200 c.c. of thick pus. The child recovered. Frankenberg (*ibid.*, Mar. 19, 1927) records a case in which the bladder wall was included in a silk ligature used to close the inguinal canal in an operation for inguinal hernia. A diverticulum with stone formation resulted. The first symptoms, painful and frequent micturition, appeared 6 months after the operation. The condition was finally (after 4 years) diagnosed by cystoscopy and rectified by operation. In 5 cases of inguinal hernia in which a 2d operation was required, due to recurrence, Sitkovskiy (Russk. Klin., Apr., 1927) found that at the 1st operation the muscles had been sutured to an aponeurotic fold of the external

oblique muscle instead of to Poupart's ligament. He believes that this technical mistake may be a factor in recurrence of inguinal hernia.

Stich (Zent. f. Chir., Apr. 3, 1926) states that in 1 instance, a piece of the colon wall 10 to 12 cm. long was resected in a case of sliding hernia, having been included in the ligature thrown around the hernial sac. The patient died from peritonitis. The author states that retroperitoneal reposition of the hernial contents can be avoided if the surgeon does not omit the correct forceps fixation of the posterior wall of the hernial sac. The bladder may be injured, especially if the surgeon tries to make a deep suture.

Chessin (*ibid.*, Feb. 27, 1926) found experimentally that in inguinal hernia the suture of the muscle (Bassini's principle) should be abandoned. Cole (Lancet, May 22, 1926) has used a **silver filigree** in 60 cases of inguinal hernia, and has never had occasion to remove the filigree in any case.

**STRANGULATED HERNIA.**—The important question of viability of the intestine in strangulated hernia was studied statistically by Beller and Colp (Arch. of Surg., Apr., 1926), following 2 cases of their own in which at the operation the contents of the sac, thought viable, were replaced within the abdomen. Subsequent necropsies, however, revealed gangrene of the loops with a plastic peritonitis. To ascertain the frequency of this complication, they reviewed 278 cases of strangulated hernia occurring among 4139 cases of abdominal hernia reported, an incidence of 6.7 per cent. This showed that the ability of nature to resurrect the viability of the average injured



intestine has been exaggerated. There were 69 cases in which the compromised intestine had passed beyond the stage of congestion; 22 of these were definitely gangrenous, and resection had been performed. In 47, the contents were thought viable and were therefore reduced; 14, or 30 per cent., of these patients died, the clinical picture usually resembling either intestinal obstruction, peritonitis, or both. The authors conclude that when viability of the intestine is questionable, resection should not be performed as a matter of routine because the involved bowel, adequately protected, may be left exposed in the wound for from 6 to 8 hours before its fate is decided.

Bearse (Boston Med. and Surg. Jour., Sept. 22, 1927) studied 21 cases in patients over 65 years, operated for strangulated hernia. The causal factors were either coughing due to chronic bronchitis or emphysema, increased abdominal pressure due to increased deposit of fat in the peritoneal cavity, or the greater straining action necessary in urination and defecation due to laxity of abdominal muscles. The average duration of these hernias before strangulation had been over 23 years. There were 16 males and 5 females. But 2 of the hernias were femoral, all the others being inguinal.

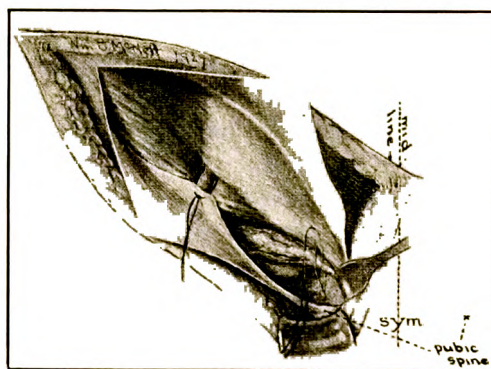
A case of strangulated hernia in an infant recorded by Griffiths (Brit. Jour. of Surg., Jan., 1927) supported Fraser's theory that the early incidence of a strangulation is related to the attempt at natural closure of the processus vaginalis. This was shown in the writer's case by a fibrous ring which acted as the constricting factor of the strangulated gut. In a case

of strangulated hernia observed by Marchinin (Omsk. Med. Journ., ii, 113, 1927) in a 13 months' old girl, following whooping-cough, the hernia was found to contain the uterus with both ovaries and tubes. Congestion of the above organs increased the strangulation, which resulted in gangrene at the end of 4 days, with death as result.

**POST-OPERATIVE VENTRAL HERNIA.**—R. L. Craig (Trans. Amer. Med. Assoc., May, 1927), by means of a follow-up system which proved efficient to the extent of 78 per cent., found that the incidence of post-operative ventral hernia following 7672 laparotomies was 1.3 per cent. The major factors were, in the order of their importance: (a) Faulty technic in opening and closing the abdominal wound; (b) infection of the wound, and (c) increase of intra-abdominal pressure, including post-operative vomiting, respiratory disease, lifting, etc. The minor factors were, in the order of their importance: (a) Obesity; (b) previous laparotomy; (c) allowing patient out of bed too soon; (d) age; (e) draining (*per se*), and (f) suture material. Multiparity did not play a rôle. The post-operative use of an **abdominal belt** proved itself to be a wise prophylactic measure, especially for patients whose wounds had been infected or were obese.

**NEWER OPERATIONS.**—W. Wayne Babcock (Surg., Gyn. and Obst., Oct., 1927) found a new method of herniorraphy of distinct advantage: The aponeurosis of the external oblique is exposed by nearly a transverse incision following the line of skin cleavage and centering over the internal inguinal ring. The fibers of the external oblique are freely separated over the inguinal canal and the edges are reflected. The hernial sac is divided at the

neck, and the neck is transfixed and ligated at a high point by a chromic catgut suture, each end of which is armed by a needle. The needles are carried from beneath the transversalis fascia through the edge of the rectus, and the suture pulled taut, transplanting and pulling the neck of the sac behind the rectus muscle. The superior surfaces of the body and ramus of the pubis are cleared by gauze dissection above and posterior to the spine of the pubis. To the ridge of the pecten ossis pubis, the lateral edge of the rectus is sutured. The 2 needles used to ligate and transplant the neck of the inguinal sac are carried through points on the shelving portion of Poupart's ligament, corresponding with their points



Babcock's method of herniorrhaphy. Obliteration of Hesselbach's triangle. The inner layer of the anterior sheath of the rectus muscle in its lower portion is being sutured to the thick tough ligamentous covering of the posterior superior edge of the pubis, posterior to the spine of the pubis and to Poupart's ligament. The shelving portion of Poupart's ligament with the attached mattress suture that has served to transplant the neck of the hernial sac is shown. (Babcock, in *Surg., Gyn. and Obst.*)

of emergence from the rectus muscle. This approximates the edge of the rectus muscle to the shelving portion of Poupart's ligament. From this central point of attachment, 1 suture is continued laterally and upward, uniting the internal oblique and transversalis to Poupart's ligament. The other suture is continued medially and downward, uniting the inner layer of the anterior sheath of the rectus to Poupart's ligament. The union of the internal oblique and transversalis to Poupart's ligament is reinforced by turning up

the flap from Poupart's ligament and the lower edge of the divided external oblique and suturing this to the anterior surface of the inner layer of the sheath of the rectus, by a continuation of 1 of the sutures. The upper free edge of the aponeurosis of the external oblique is now pulled down over the preceding suture line and united by its edge to the denuded fascia lata, giving a double imbrication. At the lower mesial angle, the suture line may be reinforced and the external ring narrowed by suturing the upper edge of the aponeurosis of the external oblique to the sheath of the pectineus by 1 or 2 single mattress sutures. The skin is closed by interrupted or buried sutures, or by Michel clips.

For difficult cases, Farr (*Surg., Gyn. and Obst.*, Feb., 1927) has devised a *modified Bassini operation*. The usual Bassini technic is carried out up to and including the placing of the deep sutures, and preceded, if possible, by a separate suture of the transversalis aponeurosis with fine chromic catgut, thus reinforcing a weak spot at the deep ring. With the usual deep sutures of chromic catgut in place, it is easy to estimate the amount of tension necessary to approximate the conjoined tendon to Poupart's ligament. If the tension seems too great for the tissues or the sutures to bear safely, they are left untied until the next step. This consists of dissecting the skin and fat away from the rectus sheath and the external oblique aponeurosis. The belly of the muscle is exposed freely, the conjoined tendon and the edge of the rectus sheath being allowed to approximate Poupart's ligament without tension. In some cases the fascial line of the linea semilunaris can be drawn to Poupart's ligament for a distance of 2 inches (5 cm.). The sutures are then tied, the cord transplanted, and the external oblique muscle imbricated.

**HERPES.**—According to Perdrau (*Brit. Jour. of Derm. and Syph.*, Jan., 1927), common herpes (herpes simplex or febrilis), whatever its situation in the body, is caused by a living agent or virus, which lives normally a semisaprophytic existence on the



mucous surfaces of most of us. It is mildly pathogenic to man, and is probably responsible for at least some cases of zoster by a local invasion of the central nervous system. Ehara (Okayama Med. Jour., Apr., 1927) holds that the viruses of herpes simplex and zoster are identical so far as his immunization studies showed.

Flexner (Jour. of Gen. Physiol., Mar. 7, 1927) draws a clear line of demarcation between the established virus of simple herpes and the hypothetical virus of epidemic encephalitis. Experimental observations on rabbits do not suffice to prove that the viruses of herpes and encephalitis are identical. Minami and Ehara (Klin. Woch., Feb. 19, 1926), however, found the rabbit testis better adapted for research on herpes than the cornea or the brain. Positive and practically identical results were obtained with inoculation of febrile and genital herpes and of zoster. They regard these 3 diseases as identical.

Heymann (Deut. med. Woch., Mar. 12, 1926) recalls Jenner's observations that the development of the smallpox vaccine pustule was inhibited in subjects with herpes or other skin disease entailing serous secretion. Gildemeister and Herzberg (*ibid.*, Jan. 21, 1927) inoculated guinea-pigs in the foot with herpes and smallpox virus. They induced a partial, but specific crossed immunity, thus accounting for Jenner's observation. Again, Bedson and Crawford (Brit. Jour. of Exp. Pathol., Apr., 1927) found that recovery from infection with the virus of herpes in the guinea-pig was accompanied by the development of a general immunity to this virus, and that the serum of the convalescent guinea-

pigs possessed the power of neutralizing the herpes virus *in vitro*.

**TREATMENT.**—Bénard and Joltrain (Bull. Soc. méd. des hôp. de Paris, July 7, 1927) treated 14 cases of herpes and herpes zoster with intravenous injections of the French Uriage sulphur springs water and obtained favorable results in 11 cases. **Uriage water** contains 6 Gm. per 1000 of sodium chloride, 3 Gm. per 1000 of calcium, manganese and sodium sulphates, and 7 volumes per 1000 of hydrogen sulphide.

Weinbren (Lancet, Oct. 22, 1927) found, in 3 cases treated, that while general ultra-violet treatment will not prevent the onset of herpes nor will the pigmented skin prevent the appearance of vesicles or scarring, **local ultra-violet irradiation** will remove the vesicles and relieve the accompanying discomfort. Heavy doses are more effective than lighter ones.

Blum (Zent. f. Chir., Feb. 27, 1926) observed a case of herpes of the cheek which recurred regularly with the menses unless he gave the woman an injection of 0.2 Gm. (3 grains) of **sodium cacodylate** on the day before the expected period.

Freund (Deut. med. Woch., Mar. 2, 1928) treated by **vaccination with the usual cowpox lymph** 7 persons who had recurrences of herpes at frequent intervals over a period of years. Of the seven, 5 have had no recurrences since; 2 had 2 recurrences each, but none since a 2d vaccination. In 1 of these the reaction after the first vaccination was absent; in the other, slight. After the second vaccination the typical pustules appeared in the first case, while in the second the reaction was again slight.

**HERPES ZOSTER.**—The prevailing tendency to believe that herpes and herpes zoster are pathogenically kindred disorders was disproved by a case reported by Marinesco and Draganesco (*Presse méd.*, Aug. 20, 1927) in which both forms occurred simultaneously, showing that the viruses differed in their natures, while the location of the eruptions tended to show that the means of defense against each also differed. The authors examined, besides a large number of cases of inflammatory lesions of the spinal ganglia without zoster (typhus, tabes, etc.), 5 cases of cancerous infiltration of the ganglia in subjects who, during life, did not present zoster. They conclude that symptomatic zoster is only unrecognised idiopathic zoster. The eruption is usually accompanied by lymphocytosis of the spinal fluid. The anatomicoclinical facts tend to prove that the eruption of herpes zoster is a cutaneous lesion due to a special virus which acts through the sensory and vasomotor nerves to give rise to the exanthem and to the characteristic vesicles. The inflammatory process spreads to all the elements of the skin and involves the vessels, glands, and nerve bundles. The zosteriform eruption is not a trophic disturbance. It is always propagated throughout the length of preformed routes existing in the nerves.

There is a remarkable tendency of herpes zoster and *varicella* (chickenpox) to suggest a kindred underlying cause, while the causal product may be one evoked in the course of either disease. Thus, R. L. T. Grant (*Med. Jour. of Austral.*, Feb. 5, 1927) reports a case which developed a typical generalized varicella at the height of

a severe herpes zoster eruption along the left 6th and right 7th thoracic nerves. The rash was profuse on the chest, back, abdomen and scalp, and scattered on the extremities and face and mouth. Conversely, S. A. Glaubersohn (*Derm. Woch.*, Jan., 1928) observed 2 cases which showed a bilateral herpetic rash, while in 2 others the herpes preceded a varicella infection in the same household. A further case is of interest, for a herpes zoster of the left shoulder region followed 17 days after vaccination on the left arm. A similar coincidence has been recorded by Chatelliers.

Contamination is also evident in some instances. Thus, Cleveland (*Can. Med. Assoc. Jour.*, Nov., 1927) describes a case in which herpes zoster in an adult was followed after a lapse of time corresponding to the incubation period of varicella by an outbreak of typical varicella in the daughter of the patient, who, as far as could be determined, had not been exposed to other cases of varicella. After a further similar period the patient with zoster, who had never had varicella, developed a generalized rash showing lesions typical of varicella, accompanied by lesions in the lower extremities resembling erythema nodosum. This case, according to the author, is offered as furnishing strong evidence in favor of the theory of a common origin for varicella and a certain proportion of all cases of herpes zoster.

To place the question on a sound foundation, Netter and Urbain (*C. r. Soc. de biol.*, Jan. 22, 1926) examined the serum of 100 subjects with herpes zoster and 24 with varicella, using the crusts for antigen. The crossed and homologous complement fixation



tests were positive in 93 per cent. in herpes zoster, and in 91.7 per cent. in varicella. The amount of antibodies was minimal the 1st days of the eruption; maximal within the 2d week, but they persisted sometimes for as long as 18 months. Crusts of varicella and of herpes were used in cases with herpes or varicella, or either of the crusts alone. The behavior of the antigen and antibodies was identical in all. Six cases of herpes zoster seemed to be responsible for development of varicella in persons who had been in contact with them. In 2 instances, zoster developed in a varicella focus. In 8 cases herpes zoster accompanied varicella. They suggest that the varicella virus inducing herpes had passed through a kind of mutation, analogous to that of the smallpox virus in relation to vaccinia.

**TREATMENT.**—H. P. Jacobson (Cal. and West. Med., Jan., 1926) found **red light**, an advantageous adjuvant in smallpox as is well known, of advantage in the treatment of herpes zoster. In a case of intractable zoster treated by G. Pieri (Archiv. Ital. di chir., Apr., 1927), **removal of the corresponding spinal ganglion** was followed by recovery. The cure is now of 10 months' duration. Microscopically, the ganglion disclosed a chronic inflammatory process of a destructive character.

**HICCUP (SINGULTUS), SIMPLE AND EPIDEMIC.**—This symptom, according to Cohn (Deut. med. Woch., May 28, 1926), may be provoked in the fetus *in utero* by cooling of the skin of the pregnant woman or too rapid drinking. In infants, W. R. Pendleton (Amer. Jour. Dis. of Childr., Aug., 1927) observed

that it may follow regurgitation after nursing, probably due to the irritation from gastric contents lying in a sensitive esophagus. Although this regurgitation was noted in only 18 out of 51 attacks of hiccup studied, the author conjectures that fluids might have passed into the esophagus without leaving the mouth and so without being noticed. This explains the fact that giving of water stops the hiccup, the theory being that sufficient water, quickly swallowed, will free the esophagus of its irritating contents. To test this hypothesis, a normal group of hiccupping infants was selected and **warm water** was given by bottle to stop the hiccup, nipples with large holes permitting a free flow of water proving most satisfactory. The treatment proved effective, as did the use of **supplementary feeding mixtures**. A control series was observed in which hiccupping infants were permitted to suck nipples on empty bottles. But 2 out of 9 infants stopped hiccupping, thus confirming the deduction vouchsafed.

Hiccup may prove rebellious as the result of a spinal and cerebral secondary lesion. Thus, Urechia and Mihalescu (Bull. Soc. méd. des hôp. de Paris, Feb. 3, 1927) treated a man, aged 54, suffering from cancer of the pylorus and acidosis. Hiccup occurred and persisted 12 days. The necropsy showed capillary hemorrhages and cellular lesions in the gray substance of the cervical spinal cord at the site of the phrenic center, in keeping with repeated findings in epidemic hiccup. There were also changes in the periventricular nucleus of the tuber cinereum, explaining the acidosis. These lesions initiate spas-

modic contractions of the diaphragm, causing an abrupt inspiration, which is then cut short by a sudden contraction of the glottis.

In **EPIDEMIC HICCUP**, cerebral lesion may play a dominant rôle. Such a case was observed by Rose-now (Arch. of Neurol. and Psych., Sept., 1927) in a patient who died of thrombosis of the posterior inferior cerebellar and vertebral arteries at a time when epidemic hiccup was occurring in Rochester. In this case, intermittent hiccup was a prominent symptom. The streptococcus isolated from the nasopharynx, the urine and the blood resembled in every respect one which the author had isolated in cases of epidemic hiccup. In consideration of all the facts, it would seem that this patient's attack of thrombosis of the posterior inferior cerebellar and vertebral arteries, and of intermittent hiccup, and the death consequent thereto, were all due to localization in the medulla of the streptococcus of epidemic hiccup.

**TREATMENT.**—The pathogenesis of hiccup in infants submitted by Pendleton (*loc. cit.*) throws light upon the origin of the symptom. As remarked editorially (Journal Amer. Med. Assoc., Sept. 17, 1927), referring to his demonstration, it is not even necessary for actual visible regurgitation to occur. Any intrusion of the gastric contents into the esophagus by escape through the cardiac orifice of the stomach may suffice. This effect may result through distention of the stomach with milk, air or water, as well as from a spastic condition or a poorly functioning valve at the cardia. In any event, relief follows treatment by **administration of fluids rapidly by mouth** and in such

amounts as will clear the esophagus. Mere swallowing movements usually do not suffice. Actual records have shown that in infants, 6 or 7 c.c. ( $1\frac{1}{2}$  or  $1\frac{3}{4}$  drams) of **water** consumed within 1.2 minutes will immediately stop most cases of hiccup of esophageal origin. The unaided relief probably follows the partial emptying of the stomach in natural ways, whereby the possibility of renewed esophageal irritation is averted.

In adults, R. F. Sheldon (Trans. Amer. Med. Assoc., May, 1927) recalls that Sword had found that cases of otherwise uncontrollable post-operative hiccup were controlled, and the patient's life saved, by **inhalation of carbon dioxide**. Carbon dioxide, from 5 to 5.6 per cent., with either oxygen or air, is the best stimulus for the respiratory center. The 11 cases in which it was used included epidemic idiopathic hiccup and hiccup during and following gas-oxygen anesthesia, post-operative laparotomy, post-operative hernia and post-operative cystostomy.

Schottmüller (Münch. med. Woch., May 20, 1927) contributes testimony to the good effect of **amidopyrine** in hiccup. He starts with 0.3 or 0.5 Gm. (5 or 8 grains) and gives as many as 5 doses a day, if the hiccup returns.

Khachikoff (Med. Obozr. Nizhn. Povol., Nov.-Dec., 1926) observed 2 cases of hiccup of *malarial* origin in men aged 45 and 50. It occurred every 4 or 5 minutes and was accompanied by fever which resisted the usual measures of treatment. The patients living in a place where malaria was endemic suggested quinine. This cured the hiccup. One patient was given 0.2 Gm. (3 grains) of

quinine hydrochloride orally every 2 hours, 5 times a day. The other was injected subcutaneously twice a day with quinine, 3 Gm. (45 grains), and antipyrine, 2 Gm. (30 grains), in water, 5 c.c. (1¼ drams). The author knows of only 1 similar instance, that described by Ovchinskiy.

#### HIRSCHSPRUNG'S DISEASE.

—A family was observed by Butter-sack (Münch. med. Woch., Sept. 23, 1927) in which, of the 4 children, 1, a male, had Hirschsprung's disease. Of the 11 grandchildren, 2 boys and 1 girl had Hirschsprung's disease. The other members of the family were normal.

Bensaude, Cain and Layani (Arch. des mal. de l'app. dig., Jan., 1928) reported a case in a boy of 16 years who complained of dyspeptic disturbances, beginning after meals and lasting 3 or 4 hours, accompanied by pain in the infrahepatic region, intermittent vomiting and attacks of flatulence with passing of flatus by the anus. The patient's appearance and his mental condition indicated an incomplete acromegalic syndrome, traceable to an epidemic encephalitis which had occurred 2 years before. The patient, however, was not constipated. Diet and other treatment improved the gastric symptoms. The megacolon being otherwise remarkably well tolerated, no operation was advised.

#### HODGKIN'S DISEASE, OR LYMPHOGRANULOMATOSIS.

—M. Barron (Arch. of Path. and Lab. Med., Nov., 1926), from a study of 27 cases, concludes that this disorder is twice as common among males as among females, 50 per cent.

occurring during the 2d and 3d decades of life, although cases can occur in practically all ages. The average duration of the disease is under 2 years. It may be associated with a tuberculous infection. The retroperitoneal and prevertebral lymph-nodes were found frequently involved, more so than the cervical nodes. Enlargement of the spleen, contrary to the general opinion, is characteristic, the organ being at times enormous. Involvement of the vertebræ may lead to a diagnosis of Pott's disease. No tissue or organ of the body is exempt from involvement.

The Dorothy Reed cells or Sternberg's giant cells are characteristic of the disease, but the blood-picture is not. Some cases, however, present marked eosinophilia when associated with an enlarged spleen or enlarged lymph-nodes. A severe anemia of the secondary type is present in practically all cases in the terminal stages of the disease. Some cases present characteristic types of chronic relapsing fever which probably constitute an integral part of the syndrome and are not due to secondary infections. Pruritus occurs in 10 to 20 per cent. of the cases. It may appear early, at times as an initial symptom, and may precede by months or even years the appearance of any visible skin lesions, when such lesions occur. The disease is an entity anatomically as well as clinically. It is an infectious granuloma caused by an organism not yet identified. The etiologic agent is probably an animal parasite. Neither tuberculosis nor the tubercle bacillus bears any etiologic relationship to this disease. But caseation necrosis may be extensive in the lymph-nodes and thus resemble

the necrosis of tuberculosis and lead to a mistaken diagnosis. The pseudodiphtheria bacillus—*B. hodgkini*—has, in the author's opinion, no causal relationship to this disease.

The prognosis of Hodgkin's disease is always hopeless. No chronic infectious disease caused by any known bacterium is so invariably fatal. **Roentgen-ray** therapy may cause temporary symptomatic relief, but apparently has no effect on the progress of the disease. Sajous has obtained good results by the continued use of the **biniodide of mercury**.

**TREATMENT.**—In 4 cases treated by Desjardins (Amer. Jour. of Roentgenol. and Radium Ther., Feb., 1927) it was distinctly shown that careful **X-ray** treatment exerts a strikingly beneficial influence on the lymphatic hyperplasia incident to Hodgkin's disease, and that the symptoms are relieved more or less completely for long or short periods.

Lortat-Jacob and Schmite (Paris méd., Dec. 3, 1927) treated a patient with Hodgkin's disease by injections of **serum** taken from another patient with Hodgkin's disease who had been treated by radiotherapy. They injected 9.5 c.c. in 10 days in a 1st series and 11 c.c. in 10 days in a 2d series. The erythrocytes increased in number from 2,800,000 to 4,300,000, while the leukocytes fell from 22,800 to 7800, the improvement beginning after the 1st injection. After the injections, **X-ray** therapy was instituted, and after 24 treatments, the patient left the hospital apparently cured. All functional disturbances had ceased; there was an increase of 12 kilos. (26½ pounds) in weight, the glandular masses had disappeared, and the blood formula was normal.

**HOOKWORM DISEASE (ANKYLOSTOMIASIS).**—In a comparative study of the value in the treatment of this disease of carbon tetrachloride, chenopodium and thymol, Manalang (Jour. of Trop. Med. and Hyg., Apr. 1, 1926) found that in every way **carbon tetrachloride** was superior to the other drugs. It was administered in doses of 1 c.c. (16 minims) per 5.5 kilos. (12 lbs.), 7 kilos. (15 lbs.), and 10 kilos. (22 lbs.) of body weight, and mixed with **magnesium sulphate**. The only objection to carbon tetrachloride noticed was that it produced dizziness, vomiting, and a varying degree of debility. These symptoms, however, are practically *nil* when the drug is given in doses of 1 c.c. (16 minims) per 10 kilos. (22 lbs.) of body weight and in combination with magnesium sulphate. The carbon tetrachloride must be repurified to be safe. The property which renders the drug greatly superior to chenopodium and thymol, according to Manalang (Philip. Jour. of Sci., Apr., 1927), is that it destroys the ova, an advantage not possessed by other agents.

A standard dose (2 c.c.—32 minims—maximum) of **carbon tetrachloride** (60 per cent.) and **oil of chenopodium** (40 per cent.) was used by O'Brian (Jour. of Trop. Med. and Hyg., Aug. 2, 1926) in a mass therapy campaign in Siam. In all, 225,000 persons were treated with this mixture up to September 1, 1924, with but 3 deaths.

**HYDATID CYST.**—The proportion of hydatid cysts in *children* appears to be extremely small. According to H. W. Mills (Surg., Gyn. and Obst., May, 1926), who reports 3 cases personally observed and reviews



the literature, only 14 cases had previously been reported in North America.

Dew (Med. Jour. of Austral., Nov. 5, 1927) warns that exploratory puncture of even a simple cyst is dangerous and may prove fatal as a result of anaphylactic shock. The degree of sensitization varies. It is higher in patients who have undergone some complication, such as rupture, operative intervention, puncture, or recent suppuration. In these cases, any operative intervention after a period of 14 to 21 days, or even earlier, may be followed by some anaphylactic symptoms.

According to F. Dévé (Presse méd., Feb. 12, 1927), the theory of curing hydatid cysts with X-rays is merely an illusion. He found experimentally that not less than 20,000 Behnken units of X-rays are required to destroy hydatids. With the present technic, such a quantity of rays cannot be introduced into the organism without causing serious damage to it. **Operation** is so far the only rational treatment; it should be performed without delay.

**HYDROCELE.**—In view of the frequent claims of hydrocele due to *trauma*, or aggravation thereby, in its relations to the Workmen's Compensation Act, Scheele (Deut. Zeit. f. Chir., Apr., 1926) studied the evidence in 133 such cases. Due to its mobility, force applied directly to the testicle must possess a certain suddenness in order to cause injury. Although the hydrocele itself may not form until 2 or 3 months have elapsed and external signs of injury have disappeared, the immediate subjective results of the injury are severe. If these imme-

diates results are lacking in the history, suspicion is cast on the traumatic origin. The most frequent consequence of trauma to the testicle is hematoma outside the tunica vaginalis; this may lead to hematoma within it, which in turn may lead through irritation from hemorrhagic remains or traumatic periorchitis to hydrocele. Hematoma within the vaginalis, however, is rare, except where hydrocele already exists. Hydrocele caused by indirect force, such as strains in lifting, jumping backward or slipping when carrying a heavy burden, is rare, but possible. When infection of the testicle or epididymis exists at the time of the accident, the question of traumatic origin in the hydrocele becomes more complicated, for hydrocele may develop in local infection without trauma; conversely, the trauma may be responsible for aggravation of the original condition, which might not otherwise have led to hydrocele. A large hydrocele is continually exposed to trauma. Injury may make the condition worse or introduce complications, but in considering the question from the compensation angle, the possibilities in the natural course of the trouble, such as hemorrhagic periorchitis and spontaneous rupture of the wall, must be borne in mind.

**TREATMENT.**—O. Lanz (Deut. med. Woch., Apr. 9, 1926), in an experimental study of the effects of various therapeutic agents on the tunica vaginalis, found that colloidal silver caused, in 1 instance, a grave necrosis and inflammation. He warns against its use in pyelography, and the disastrous experiences since of other clinicians have shown that he is right. **Sodium bromide**, 25 per

cent., was found to be less irritating than 12.5 per cent. sodium iodide.

Bazy (Bull. de l'Acad. de méd., June 15, 1926) used with success iodine injections, among others. He used a tincture made with 1 Gm. (15 grains) of iodine and 12 Gm. (3.75 drams) of alcohol. After local anesthesia with cocaine, the fluid was aspirated and then a corresponding amount of iodine injected and left for 5 minutes. The patients were kept in bed for a few days, as a precautionary measure. The method seems to be harmless, simple and quite effective.

**HYDROCEPHALUS.**—In 8 cases of *cerebral infantile paralysis*, Koeppe (Arch. f. Kind., June 4, 1926) found that a *high tympanic percussion sound* of the skull indicated an increased intracranial pressure. The diagnosis of hydrocephalus could hardly have been made otherwise, since the most important symptom—enlargement of the head—was not present. The pressure of the cerebrospinal fluid was increased, and encephalography also confirmed the diagnosis of occult hydrocephalus. All these children were suffering from rickets and recovered after treatment of this disturbance. The writer, therefore, regards the syndrome as a manifestation of *cerebral rickets*. He found that **lumbar puncture** and **diet** are sufficient as remedial measures.

*Mumps* acted as the cause of acute hydrocephalus in a case observed by Guérin (Jour. des prat., Dec. 17, 1927). At 3 months the patient presented a bulging forehead, a fontanel larger than normal, and a large head. At 6 months he contracted mumps. One month later, the Kernig sign appeared, with projectile vomiting and

stubborn constipation. With treatment the child recovered, but relapsed, and at the 6th month of the disease had a confirmed hydrocephalus. A febrile attack with a convulsion proved fatal.

**HYSTERIA.**—The treatment of hysterical disorders in *children* has been reviewed by W. G. Wyllie (Lancet, Feb. 6, 1926). While uncommon below the age of puberty, they occur more frequently in quite young children than is supposed. Methods of treatment directed towards the immediate disabilities or symptoms of hysteria seldom fail. Greater difficulty is experienced in warding off their recurrence.

In childhood, the commonest hysterical disorders are related to the motor system, and consist of paraplegias and monoplegias. Both spastic and flaccid types occur, but the loss of power is seldom complete, and shows variations in degree from day to day. In the spastic form, which is the commonest, some degree of flexion spasm or contraction is often present at the joints, and severe pain is usually complained of. Hysterical pain spasm localized to a single joint, usually the hip, is sometimes observed, and may simulate very closely organic hip-joint disease.

Spinal rigidity resembling caries is another hysterical manifestation sometimes met with in children. That curious condition known as *astasia-abasia*, in which the patient can scarcely stand or walk, and yet is able to perform all movements of the legs voluntarily when lying in bed, may also be observed. Sensory manifestations by themselves are exceedingly rare, but may be present in associa-

tion with paralysis, and usually assume the stocking and glove distribution of anesthesia, with a definite upper level which is characteristic of their hysterical nature. Other manifestations which may arise are hysterical dysphagia, aphonia, and hysterical vomiting. Mutism, defects of vision, ptosis or spasm of the orbiculares palpebrarum, tremors, and convulsions of hysterical origin are very rarely met with before puberty.

An essential feature in the treatment of the hysterical child is to recognize the type of mother one has to deal with. Very often she is highly neurotic and unwittingly does her best to foster the "functional" defect from which her child is suffering. **Separation from home influences** is always desirable, and is more easily obtained among patients of the hospital class. Gentle but firm **persuasion**, that the loss of function will soon disappear, will effect recovery in most cases. **Massage, passive manipulations**, and the **faradic current** are useful accessory aids. Many cases make a sudden and spontaneous recovery, especially when the patient

has been placed in new surroundings. In overcoming contractures splints are to be avoided, as their presence only exaggerates the importance of the complaint in the patient's mind. Drugs are seldom necessary, but **bromides** and the tinctures of **valerian** and **asafetida** may be employed in small doses, especially as they are antispasmodics and may possibly exercise a beneficial influence upon the unstable nervous system. The symptoms of hysteria are for the most part readily cured in children, as they are usually of a more simple character than those met with in the adult.

Aragón (Gac. méd. de Mex., Apr., 1926) observed the case of a young woman in whom hysterical *laughter* had been continuous for 17 hours when first seen. A subcutaneous injection of a sedative failed to arrest the laughing. The author then applied **pressure on the ovaries**, which were tender, the young woman being in the 2d day of a menstrual period. The laughter then gradually became attenuated and subsided, the patient dropping to sleep, with the aid of the sedative.

## I

**ICHTHYOSIS.**—In a study of 10 cases of ichthyosis in children over 8 years of age in whom, among other factors ascertained, the effects of thyroid medication were determined, A. Porter (Brit. Jour. of Derm. and Syph., Dec., 1926) observed that those in whom the basal metabolism was low (—33 in 1 instance) improved rapidly and definitely when given **thyroid**, while those in whom it was high (+22 in 1 instance) failed to re-

spond to its action. The metabolic rate is a certain method of deciding whether thyroid should be administered in a given case.

**IDIOCY.—MONGOLIAN IDIOCY OR MONGOLISM.**—Of the forms of idiocy, mongolism is attracting the widest attention, owing to its increase since the World War. This would hardly apply to Spain, however, and in reporting 9 cases

Cavengt (Arch. esp. de ped., Sept., 1927) thinks that more accurate diagnosis may be a factor. No medication has so far proved very successful, but that some hypothyroid patients are occasionally mistaken for mongolian cases might, he thinks, explain cures reported following the administration of **thyroid**.

In a comprehensive study, Van der Scheer (Ned. Maand. v. Gen., xiii, 407, 1926) gives data from 350 families in which a child with mongoloid idiocy was born. Over 60 per cent. of these children were not only the last born, but there had been an unusually long interval since the birth of the preceding child. A large proportion of the mothers were over 40 years of age. Other malformations or deformities in the other children, abortions, and stillbirths were comparatively frequent in the mongoloid idiocy families. In only 12 of the 338 mongoloid families were other children feeble-minded, and in 7 of these families the other mentally deficient child presented the mongoloid type also. This proportion of only 12 in 338 families testifies that the usual causes—syphilis, alcoholism, consanguineous marriages and hereditary factors—cannot be incriminated for mongoloidism. Studying the subject from all these various standpoints, it becomes evident that some special factor is involved, and that this must be sought in the mother and in her uterus.

While calling attention to the rarity of familial mongolism, M. P. Borovsky (Jour. Amer. Med. Assoc., Feb. 11, 1928) cites 3 female mongols who were offsprings of 2 sisters. In 1 of these families the father had been married previously and had had 5

normal children by the first wife. The author considers this observation as pointing to an endogenous maldevelopment. The maternal source of the condition is also favored by D. M. Greig (Edinb. Med. Jour., June, 1927) who concludes that mongolism seems rather to be a defect in growth (fetal) than a defect in development (embryonic).

**TREATMENT.**—The prevailing belief that nothing can be done for the mongolian form of idiocy is due to the fact that clinicians who observe cases formulate haphazard theories without taking the trouble to analyze recorded studies concerning its genesis and treatment, contenting themselves, as regards the latter, with mere repetitions of text-book statements. Sajous pointed out many years ago that the phospholipoids of the mongolian were deficient—a defect of fetal origin—and recommended, on the basis of experience, lipoids of the **lecithin** class or **thymus gland** which is rich in this substance. N. P. Barnes, of Washington, D. C., has also found **thymus** very beneficial. Timme (Bull. Wayne Co., Ill., Med. Soc., June 19, 1928) has found **pituitary substance** in solution, administered hypodermically, capable of materially benefiting mongolian idiots. The anterior lobe of the pituitary particularly is rich in lecithin, thus falling into line as regards the genesis with Sajous's original teachings. An essential factor, however, is patience in the treatment of these cases. It requires years to rebuild, at least partly, their deficiency. Very small doses,  $\frac{1}{8}$  grain (0.008 Gm.), of **thyroid** materially aid the treatment, particularly if a cretinoid element can be discovered in a given case.



In the feeding of such patients, particularly when seen during infancy, the remarks of B. Epstein (Jahrb. f. Kind., Oct., 1927) covering normal infants are quite applicable. This author holds that meat, especially in the form of a meat pudding, is not unsuited for feeding infants. He used calves' and pigs' brains, calves', beef and lambs' liver, and thymus made into a sort of soup. Such feedings are not, however, begun until after the 6th month, usually not until the 9th month. The value of the brain and liver feedings is said to lie in their fat content; this, with the albumin content of the thymus, increases the caloric value from 30 to 100 per cent. over that of mother's milk.

According to Veith (Psych. Quart., Jan., 1927), but contrary to current belief, the idiot and the imbecile can be trained to perform quite difficult tasks. They are capable of making only a few associations of the most simple nature, and those resulting from identical experiences. Thus, their training involves not only laborious but continuous effort in taking them away from their world of inferiority and giving them greater contact with their outside world.

**INFANT FEEDING.**—The question of the *vitamine content of human milk* is being increasingly investigated. In a series of papers in the Journal of Biological Chemistry (May, 1927), Macy, Outhouse, M. L. Long, and A. Graham describe an investigation of this question. They conclude that in human beings, as in other mammals, there is a direct connection between the diet of the mother and the amount of vitamine in her milk. The value for vitamine A of human milk from a wet-nursing bureau was found not to differ greatly from that of the milk of cows

which had been allowed alfalfa hay and ensilage with cereals, but no pasture. The milk was tested not only by the growth of rats but also by their power to reproduce and rear their young, and the interesting observation was made that a certain daily ration of vitamine A may be enough for a mother rat to grow, reproduce, and lactate, yet when her offspring are tested on a diet deficient in vitamine A, they may quickly show that they have little or no reserve. This observation teaches a valuable lesson. In regard to vitamine B, the authors did not get so clear-cut a result, nor was it quite certain with which fraction of vitamine B they were dealing; probably it was with the anti-neuritic fraction. They concluded that "the anti-neuritic potency of mixed human milk, at least from a group of women receiving the average American dietary, is very slight," and further, that "it is possible that many mothers do not supply enough of vitamine B to their babies."

The milk of 86 nursing mothers was analyzed by B. Myers (Brit. Jour. of Childr. Dis., Oct.-Dec., 1927). The average analysis was: Protein, 1.58 per cent.; fat, 3.85 per cent.; lactose, 6 per cent., and the caloric value per ounce, 18.95. The last 3d of the milk contained the highest percentage of fat. The milk of a nursing mother is apt to vary to some extent even from day to day, but unless this variation is excessive it does not affect the nursling.

The increase in weight of breast-fed infants was studied by Brandt (Norsk Mag. f. Laeg., Nov.-Dec., 1927). In 1925 and 1926, in the women's clinic in Oslo, where breast feeding is given according to Budin, most full-term infants had recovered their initial loss of weight by about the 12th day. Large as well as small infants (premature) increased in weight more slowly than those of average size, but in the premature the initial loss was slight or none, as feeding began immediately after birth.

LaFetra (N. Y. State Jour. of Med., Feb. 15, 1927) called attention to the fact that the various carbohydrates have different rates of absorption in the digestive tract, the simple monosaccharides being absorbed more quickly than the complex sugars, dextrins and starches. The different sugars, until absorbed from the intes-

tinal tract, have special tendencies to different types of fermentation. Carbohydrates should be furnished in the diet of infants and children to the amount of about 50 per cent. of the total calories.

**MODIFIED MILKS.**—V. E. Levine (Arch. of Ped., May, 1927), referring to *pasteurization*, recalls that it came into being before we knew much about the effects of dead bacteria upon the higher animals. It was based upon the conception forced upon us by the limited knowledge of those days that bacteria once killed could be of no harm to the human being. He cites Park and Holt (*ibid.*, xx, 881, 1903), who reported that the use in New York City of normal cow's milk containing 7 million to 25 million organisms per c.c., and which had been subsequently pasteurized, was accompanied by a distinct increase in the incidence of diarrheal disease.

The deleterious effects of killed bacteria upon human organisms is shown in the death rate from gastroenteritis in infants which occurred in Baltimore during 1922, 1923 and 1924. Dr. Mary Sherwood, Director of the Bureau of Child Welfare in the Department of Health in Baltimore, pointed out that during the summer of 1922 there was a surprising and inexplicable increase in the mortality of infants under 2 years of age as the result of gastroenteritis. Inquiries showed that in spite of the fact that 98 per cent. of the milk of Baltimore was pasteurized, the average bacterial count of milk brought in for pasteurization during 1922, 1923 and 1924 was higher than that during 1921.

Recently, hemolytic streptococci of beta type were found in considerable numbers in certified milk by J. H. Brown, W. D. Frost and M. Shaw (Jour. of Infect. Dis., May, 1926). The milk was from 5 dairy herds. The streptococci belonged to several distinct cultural and serologic groups. There was no evidence, however, that any of them, whether from gargety cows or from mixed milk, was pathogenic for human beings. The causative organism of *milk-borne septic sore throat* is *Streptococcus epidemicus*. This streptococcus is probably of human origin, but occasionally may gain entrance to the udder of a cow and find its way into the milk supply. The hemolytic streptococci

commonly found in milk show distinct cultural and biologic differences from *S. epidemicus*. No single test, however, can be relied on to differentiate them.

**ACIDIFIED MILK.**—The addition of either lactic, hydrochloric, acetic or citric acid, according to H. L. Dwyer (Jour. Kans. Med. Soc., May, 1926), renders cows' milk more digestible. It can be fed in greater concentration, and thus is useful in correcting digestive disorders and marasmus.

Lunz (Arch. f. Kind., Sept. 30, 1927) tried **acidified milk** as a permanent diet in 45 children ranging from 2 weeks to 2 months in age. At first they were fed with acidified milk mixtures for 4 to 5 months. All the children received lactic acid milk, but 20 of them were given citric acid milk for 1½ to 2 months. The majority of the children, even in the first months of life, digested the acidified milk in suitable dilutions well and thrived much better on it than on ordinary sweet milk mixtures. The **citric acid milk** was made by adding 4 Gm. (1 dram) of pure citric acid to 1 liter (quart) of milk. At the end of 4 weeks the infant was being fed exclusively on this mixture with a 5 per cent. addition of sugar.

In 50 infants, aged from 1 day to 6 months, fed by J. A. Stephen and E. R. C. Walker (Lancet, July 9, 1927) with **lactic acid milk** as a routine food, the results were satisfactory, comparing favorably with those obtained by ordinary methods of dilution feeding.

The 50 cases observed by F. C. Neff and T. G. Dillon (Jour. Kans. Med. Soc., May, 1926) show that *newly born infants*, as a rule, do gain better when fed additional food in the form of **lactic acid milk** until sufficient breast milk is supplied. The value in this method lies in the fact that the milk is rendered more digestible by being sour, and more food can be handled. Milk soured in other ways is probably just as good; the authors have not infrequently used **buttermilk** when additional food is needed for the newly born. The usual formula has been: Holstein milk (whole), 8 ounces (240 c.c.); lactic acid, U. S. P., 15 drops; water, 8 ounces (240 c.c.); dark corn syrup, 1 ounce (30 c.c.). The milk is boiled gently for 5 minutes, the scum removed, and to each 8 ounces of the cooled milk are added 15 drops of the acid, the

milk being stirred when each drop is added. This formula is given to infants only during the first 3 or 4 days of their life, or until the breast milk is established.

Basing his opinion on over 1000 cases, E. P. Baumann (Med. Jour. of So. Afr., Sept., 1926) confirms the favorable results reported by others from the use of soured milk as a therapeutic diet in infancy. **Lactic acid milk**, by virtue of its cheapness and ease and rapidity of preparation, appears to be the artificial food of choice in all conditions of departures from health in early life. It is simple enough for employment in the home. Ill effects were not observed from its use and no contraindications are known. Nevertheless, lactic acid milk is not to be regarded as capable of replacing human milk in infant dietetics.

**ACCESSORY FOODS.**—A series of 36 male and female infants were studied by H. H. Perlman (Arch. of Ped., Jan., 1928) to determine the value of **gelatin** as a means of increasing body weight. The survey was divided into 2 groups. One division of 18 infants received gelatinized milk for several weeks, while the other group of 18 babies received simple dilutions of whole milk as a control over a similar period of time. The gelatinized milk-fed babies fared far better than those fed upon simple dilutions of cow's milk. Those fed upon cow's milk formulas vomited more frequently than those receiving gelatinized milk. The average weekly gain in infants during the first year fed by means of gelatin milk was 6.1 ounces (189 Gm.); in the controls, 4.2 ounces (130 Gm.). The average weekly gain in infants during the 2d year upon gelatin milk was 4.4 ounces (136 Gm.), as compared to the single case in the control series of 7.2 ounces (223 Gm.).

**INFLUENZA.**—At the present time the tendency is to apply the term "influenza" or "grippe" to common colds and all kinds of indeterminate febrile conditions. The true meaning of the term is thus overlooked, and its serious character likewise. The early precautionary and judicious remedial measures are neglected, and the case compromised in proportion. Physi-

cians should strenuously oppose this evil trend, remembering that an attack of true influenza, if uncomplicated, after an incubation period of approximately 48 hours, is short and sharp, with a tendency to rapid recovery, provided the patient is not allowed to leave his bed too soon, with more or less prostration as a result. The fatalities, in most instances are due to pulmonary or cardiac complications.

According to M. Renaud (Bull. Soc. méd. des hôp. de Paris, Mar. 10, 1927), the *pulmonary lesions* do not represent a special form of the disease. They are the result of a secondary infection, favored by insufficient care or an intercurrent cold. Moreover, an epidemic of pneumococcus or streptococcus disease may coincide with an epidemic of influenza. Early treatment, with proper hygienic and dietetic care, can avert these secondary phenomena.

In 157 cases observed by Hubert (Münch. med. Woch., July 13, 1928), *bradycardia* and subcutaneous, intestinal or pulmonary *hemorrhages* were not infrequently seen, the pulmonary hemorrhages being at times followed by general vasomotor paralysis. This weakness of the vasomotors may occur in mild cases, and may also cause phlebitis and venous thrombosis, particularly in the acute stage. The circulatory disturbances appearing as sequelæ occurred invariably when the primary disease was mild. Among the late results are vasomotor neurosis of the cardiac or peripheral vessels or both. When limited to the heart, they take the form of toxic vasoconstriction in the coronary region. These functional spasms of the coronary arteries must be differentiated

from angina pectoris on a sclerotic or syphilitic basis; spontaneous recovery is the rule. Symptomatically they are indistinguishable from true angina pectoris. Nitroglycerin has no effect, while tonics, hydrotherapy and sedatives give good results.

In 5 infants who died with the clinical symptoms of *influenzal sepsis*, Buchholz (Monat. f. Kind., Jan., 1927) was able to cultivate influenza bacilli (Pfeiffer) in pure cultures both from material obtained by puncture of the heart and from the bloodstream. The clinical picture of *influenzal sepsis* in infants is characterized by sudden onset during complete health, rapid course and fatal result. Meningitis is a frequent complication.

**ETIOLOGY AND PATHOGENESIS.**—The infectivity of dried pathogenic micro-organisms carried by dust is emphasized by B. Lange and E. Jochimsen (Zeit. f. Hyg. u. Infekt., Oct. 24, 1927), after careful experimental studies. The dust on floors, clothing and handkerchiefs contains bacteria that retain their infectious power in an astonishing degree for a long time.

P. Durand and U. Lumbroso (Arch. de l'Inst. Pasteur, June, 1926) conducted an extensive research apparently demonstrating that, except for its origin in acute conjunctivitis, there is nothing to distinguish the Weeks bacillus from the influenza bacillus, either morphologically or by serologic, biochemical or cultural tests. In a second communication, however, Durand, C. Anderson and Lumbroso report that the 2 species respond differently to agglutination with lactic acid. Thomson and Thomson (Lancet, May 28, 1927) describe a pleo-

morphic streptococcus which they have found in the blood of influenza patients.

According to A. Adam (Jahrb. f. Kind., May, 1926), the decrease in infant mortality is limited to the nutritional disturbances. Diseases of the respiratory tract do not participate in the decline. He made 500 blood-agar cultures from the nasal and pharyngeal secretions. Pneumococci of Type IV were found in 60 per cent. of the children under 2 years of age; in 51 per cent. up to 6 years; in 33 per cent. up to 14, and in only 2.5 per cent. of the adults tested. He suggests the name "*pneumococcus planus*" for this type.

**TREATMENT.**—According to E. B. Turner (Brit. Med. Jour., July 16, 1927), **salicin** not only cuts short influenza, but abolishes the numerous sequelæ. It is important to give the drug as soon as there is a definite rise of temperature; to keep the patient **warm in bed**, on light simple food, and to give 20 grains (1.3 Gm.) of salicin every hour for the first 12 hours, then 20 grains every 2 hours for the next 12 hours. For young persons, 1 grain (0.065 Gm.) for each year of the patient's age, with 1 grain extra "for the pot," is effectual. After the age of 18, the full 20 grains should be administered.

Ludewig (Deut. med. Woch., Dec. 10, 1926) recommends **autohemotherapy** in influenza. In the treatment of both influenza and its complication, pneumonia, Korbsch (Münch. med. Woch., July 1, 1927) injected 130 c.c. of **mixed convalescent serum** in a pregnant woman with massive infiltration of the entire lower lobe of the left lung. She recovered. **Camphor in oil** and **digitalis** were also used.

Excellent results are reported by



L. J. Picton (*ibid.*, Apr. 2, 1927) from the administration of **raw sheep's adrenals** in the treatment of *post-influenzal debility*. One fresh gland is cut into 6 pieces lengthwise so that each piece contains both cortex and medulla, and 1 such piece is taken raw, on an empty stomach, thrice daily. The headache and lassitude soon clear up and the patient recovers normal health.

#### INSANITY. — DIAGNOSIS. —

The blood serum of 101 patients studied by E. Armstrong and W. Hood (*Jour. of Ment. Sci.*, Jan., 1927) showed that the calcium content lies within normal limits, in mental diseases, and that a high or a low content is not diagnostic of any specific disorders.

Analysis of 22 cases of neurasthenia, 13 of psychasthenia, and 22 mixed cases by S. B. Hall (*Lancet*, Sept. 10, 1927), with reference to the *blood-pressure*, showed it to be low in all. The converse was the case, however, after persistent mental strain or anxiety neuroses, although in a small group of psychasthenic persons, the pressure may be abnormally and persistently high. The blood-pressure, when abnormally high, falls to within normal limits as the mental condition yields to treatment. The initial blood-pressure readings in highly strung or neurotic patients may appear to be higher than is actually the case, even to the point of considerable abnormality. The sudden rise of pressure is excited by some extraneous stimulus to the emotions, and thence directly through the sympathetic system, or indirectly by the sympathetic system and suprarenals, to the vasomotor system. Studies by Parkin (*Jour. of Ment. Sci.*, Apr., 1927) also

indicated that in all forms of mental disease, recent emotional reaction was the main cause of increases of the systolic pressure. The sooner the observation was made after the commencement of the excitement or agitation, the more marked the rise, which, however, was transient; again, if the excitement or agitation was prolonged, there would be a fall of systolic pressure.

R. N. Craig (*Lancet*, Apr. 30, 1927) studied the *blood-sugar* curve or carbohydrate metabolism in 90 cases of mental disorder, but no characteristic curve was found for any of the disorders studied. In anxiety neurosis, however, a failure to return to the original fasting level was present in 87 per cent. of the cases. In epilepsy and melancholia, an apparent defect in carbohydrate metabolism was found in all cases.

B. Reid (*Jour. of Ment. Sci.*, Apr., 1927), using the van den Bergh test, the fasting blood sugar, the lipase test, and the indican test of the urine, found no abnormality such as an auto-intoxication from metabolic disorder would suggest. In depressed patients, an increase of the non-protein nitrogen content of the blood was found, which might support the theory of Loney that there exists a relationship between certain toxic amines and melancholia.

A study of the blood in 2104 cases by Proescher and Arkush (*Jour. of Nerv. and Ment. Dis.*, June, 1927) showed that the character of a psychosis is neither determined nor indicated by the *blood-group*, though the susceptibility to a given disorder may be suggested.

The *fragility and solubility of the erythrocytes* in mental disease were

studied by Scoresby-Jackson (Jour. of Ment. Sci., Apr., 1927). Of 64 cases tested, 40 showed approximately normal solubility of the red cells in sodium taurocholate, while 24 showed increased solubility. As regards the fragility of the red cells in sodium chloride solutions, in 55 per cent. of cases the results were outside normal limits. Cases in which the hemolytic point was markedly raised or lowered did not present any sign of a definite physical lesion. No marked difference could be discerned in the fragility between patients who were not given drugs and those who were.

**ETIOLOGY.**—That *focal sepsis* or *infection* may be an active causal factor in many forms of insanity was illustrated in an analysis by W. Hunter (Brit. Med. Jour., Nov. 5, 1927) of 200 cases in which the removal of a focal sepsis was followed by noticeable results. The cases included manic-depressive insanity, dementia precox, paranoid conditions, psychoneurosis and toxic psychosis. The sites of sepsis were mostly the teeth, tonsils, stomach, cervix, colon and seminal vesicles.

Similarly suggestive is an analytic study by Giessing (Norsk Mag. f. Laeg., Oct., 1927) of the different views held on the relation between chronic infection to mental disorders, with special reference to Cotton's view of the pathogenic influence of localized infections. Since the elimination, as far as possible, of the chronic infective process frequently results in improvement, the infection may be considered an important etiologic factor, with the advantage over many factors that it can be attacked. He considers the prophylactic side as equal in value to the strictly curative.

F. H. Stewart (Jour. of Ment. Sci., Jan., 1928) attaches much importance to the etiologic influence of the *bacterial flora of the colon* in mental disorders. He found *B. paracoli* or *B. coli-mutabile* in 30 to 40 per cent. of mental patients, and in 17 per cent. of these patients these bacteria made up 10 to 100 per cent. of coliform flora. Carriers of *B. paracoli* and *B. coli-mutabile* were at least 4 times more common among the insane than in normal subjects. Paracolon mutabile bacilli were found in all forms of insanity, but more frequently and abundantly in acute illness than in chronic. In some recurrent cases studied closely, they were absent or few in number during intervals, increased rapidly at the onset of an attack, fluctuated with the symptoms, and disappeared at convalescence.

The importance of focal infections in the genesis of insanity is emphasized in an elaborate paper by Weygandt (Brit. Med. Jour., Aug. 18, 1928) in which he states that "an extraordinary quantity of biologic and chemical changes occur which can be explained by autointoxication."

**TREATMENT.**—The *malaria treatment* was tried by A. Marie (Revue de méd., xlii, 997, 1925) in 236 cases of *general paralysis*, with success in 35 per cent. He urges this method of treatment in other forms of insanity. In his asylum service, a positive Wassermann was obtained in 24.78 per cent. of 234 cases, excluding the general paralysis cases. This unsuspected prevalence of a syphilitic factor justified application of the malaria treatment in other than the latter. He has been systematically resorting to it for several months in post-encephalitic parkinsonism, dementia precox and epilepsy. The cases in which benefit was witnessed seemed to be always psychoses influenced to

a certain degree and more or less indirectly by a syphilitic taint.

C. B. Molony (Jour. of Ment. Sci., Jan., 1927) reports 53 cases of psychoses treated by **endocrin therapy**. The largest proportion was in women at the climacteric—42 cases in all. The results in these cases (using **thyroid, ovarian and pituitary** substances) consisted of recovery in 83 per cent.; improvement in 11 per cent., and no improvement in 6 per cent. No case of mental disorder, more particularly if it supervenes at puberty or the menopause, however advanced or hopeless, should be considered incurable until disordered endocrin function has been definitely excluded, whether this be done by the absence of characteristic symptoms or by the failure of response to organotherapy. The latter fulfills a very important and useful rôle in the treatment of psychoses in carefully selected cases. Compound **ovarian extract**, in private practice, will obviate the necessity for certification in many cases. Polyglandular dyscrasias are the rule in the endocrin psychoses, and pluriglandular therapy should give the highest percentage of satisfactory results.

J. P. Steel (Brit. Med. Jour., Dec. 24, 1927) resorted to regular and repeated **injections of Ringer-Locke solution**. They proved of definite benefit in cases in which there was a toxic element. The mental condition seemed to improve more rapidly under this treatment than when "forced" elimination alone was employed. In debilitated toxic patients the time before the toxic focus can be attacked is materially shortened. Weakened general paralytics seemed especially to benefit to a very considerable degree.

**INTERMITTENT CLAUDICATION.**—In a comprehensive review of this subject, Cortes (Arch. de med. cir. y espec., May 19, 1928) holds that but 3 forms of treatment afford tangible results, *viz.*, **diathermy**, the administration of **insulin** and of **sodium nitrite**. In 5 personal cases treated with insulin, no benefit was observed; in 1, however, success was complete. In the 5th case benefited, diathermy was given besides the insulin. Diathermy allays the pain in most cases. Recently the author has used intramuscular injections of **sodium nitrite** in doses of 0.04 to 0.06 ( $\frac{2}{3}$  to 1 grain), 2 or 3 times a week. As yet he has had no occasion to treat claudication of the lower extremities by this method. In 2 cases of angiospasm of the fingers with sensation of dead finger and marked ischemia, the nitrite proved very efficient.

Gill and Moss (Lancet, Oct. 29, 1927) observed a case in which **diathermy** produced excellent general and local results. The patient was greatly improved, and at the time of writing no further attacks had occurred.

**INTERTRIGO.**—This skin disorder, when attended with inflammatory lesions with pruritus, located chiefly in folds of the skin, anal or vulvar, and also microbic or mycotic intertrigo, and oïdiomycoses, are treated by Sabouraud (Médecine, Nov., 1926) in the following manner: A wad of cotton held by hemostatic forceps is soaked in **alcoholic solution of iodine** (1:100) and the affected area is rubbed vigorously with it, after removing the scales. The burning occasioned lasts only a minute. If the lesions are streptococcic, the

following ointment is used: **Stovaine**, **calomel** and **tannin**, 0.3 Gm. (5 grains) each, mixed with 30 Gm. (1 ounce) of petrolatum. This is repeated daily. If the lesions are of mycotic origin, an ointment is used composed of **benzoic acid** and **zinc oxide**, 1 Gm. (15 grains) each, in 30 Gm. (1 ounce) of petrolatum. For a stronger effect, 3 Gm. (45 grains) of **benzoic acid** are mixed with 3 Gm. of **salicylic acid** and 30 Gm. (1 ounce) of petrolatum. In the author's cases the itching subsided on the 1st application. Recurrence is apt to follow, requiring repetition of the treatment, in mycotic lesions on the palm of the hand and sole of the foot.

**INTESTINAL OBSTRUCTION.—DIAGNOSIS.**—According to K. S. Davis (Amer. Jour. of Roentg. and Rad. Ther., May, 1927), the diagnosis of intestinal obstruction and the approximate site of the lesion can quickly be determined by means of a *roentgenogram*, because the intestine above the obstruction is ballooned out with gas.

To determine whether or not there is an obstruction to the flow of *bile* into the intestine, Mort (Lancet, Dec. 24, 1927) gives sodium tetraiodophenolphthalein by mouth in powder form, in doses of 40 to 60 grains (2.6 to 4 Gm.), the dose varying with the body weight of the patient. If the capsules pass on intact into the large intestine, it indicates that an obstruction is present in the region of the ampulla of Vater, causing deficiency not only in bile flow, but also in the pancreatic juices, especially steapsin.

*Chronic duodenal ileus* is deemed more common than is generally believed by C. C. Higgins (Arch. of

Surg., July, 1926), who found this to be the case after a study of 57 cases. Undoubtedly many cases are unrecognized. Owing to the severe headache associated with this condition, a diagnosis of migraine is usually made. Some patients have been treated for migraine for years without relief. Severe headache associated with vomiting should suggest a careful examination of the duodenum. When dilatation is insufficient to produce duodenal stasis and is associated with gastropnoia, an effort should be made to secure relief by non-operative measures. If the dilatation is marked and stasis with antiperistalsis is present, a *duodenojejunostomy* should be performed. The mortality of this operation is practically *nil*, and excellent results may be expected.

Haden and Orr (Jour. of Exp. Med., Mar., 1927) found that when high gastro-intestinal tract obstruction exists the *blood-fibrin* increases rapidly. The change is more marked in animals with obstruction of the cardiac end of the stomach. The rise in fibrin parallels closely the toxemia characteristic of such conditions. These results indicate that liver insufficiency cannot be the cause of death in such obstructions.

An experimental study of intestinal obstruction led the same writers (*ibid.*, Nov., 1927) to conclude that while the rapid fall in the oxygen content of the venous blood of the dog after upper gastro-intestinal tract obstruction is due to a combination of several factors, there is much evidence indicating that active reducing bodies are present in the blood and that this fact explains the anoxemia observed.

**ETIOLOGY.**—Apparently insignificant factors are apt to be over-



looked as causes of intestinal obstruction. Haselhorst (Zent. f. Chir., June 19, 1926) observed a number of such instances. In a woman, aged 63, and in a man, a mixture of apple, pear and peas, blocking the intestine, was the cause of ileus. He **operated** on both these cases, but advises expectant treatment with **purgatives** and **high enemas** in the less stormy cases, if the cause of the ileus can be established. Cherry stones in large quantities, raw beans, cucumbers and raw or half-cooked oatmeal are noted in the literature as having caused ileus.

A case due to *tenia* was observed by J. A. Carman (Kenya and E. Afr. Med. Jour., Aug., 1927), ending in death. At autopsy a large tapeworm was found and lower down in the intestine 6 more, varying from 10 to 20 feet in length, all in the lower part of the ileum. Constipation with severe pain in the abdomen were the only symptoms. Dmitrieff (Zent. f. Chir., July 24, 1926) reported a case in which the ileus was due to *oxyuris*.

In a 3-day old infant observed by E. A. C. Wilson (Brit. Med. Jour., Jan. 14, 1928), a band-like *adhesion* led to an operation for intestinal obstruction. The obstruction was of the jejunum; the original cause had been an intra-uterine peritonitis.

**PATHOGENESIS.**—The nature of the *toxemia* in acute intestinal obstruction has been studied by several investigators. Berg and Jobling (Arch. of Surg., Feb., 1928) produced partial obstructions representing chronic duodenal stenosis. The animals lived for long periods practically symptom-free. There was a compensatory hypertrophy of the intestinal musculature above the obstruction, the inner circular layer contributing to the hypertrophy to a greater extent than the outer longitudinal. There was also hyperplasia of the mucosa. Al-

though prolonged stasis and an increase in the bacterial content occurred in the duodenum, significant changes were not observed in other organs. In the face of all this, one cannot avoid the conviction that there must be some defence mechanism in connection with the alimentary tract. On its successful functioning the natural protection against ever present menaces in the intestine must depend. As the writers point out, in their experiments the conditions in the duodenum were made most favorable for the multiplication of bacteria and the elaboration of toxins; nevertheless, systemic effects were not produced. Whether this was due to the ability of the liver to neutralize such toxic substances remains to be determined.

The researches by B. W. Williams (Lancet, Apr. 30, 1927) tended to indicate that the toxemia in cases of acute intestinal obstruction, whether organic or paralytic, is due, in part at least, to the absorption of *B. welchii* toxin from the stagnant contents of the small intestine. It was, at least, the only toxin of which evidence was found by the most delicate tests available. This hypothesis was corroborated by the results of a therapeutic test by the use of *B. welchii* antitoxin in cases of acute obstruction.

Buchholz and Lange (Münch. med. Woch., Feb. 11, 1927) inhibited the growth of bacteria in an occluded intestinal loop by acriflavine. In spite of this, the clinical manifestations of ileus were the same as in animals whose intestines contained the usual germs. Death in ileus, therefore, cannot be due to bacterial toxins.

Experiments by Saito (Jap. Jour. of Med. Sci., June 27, 1927) tended to indicate that the *pancreas* was an important factor in causing death in cases of high intestinal obstruction.

The pancreatic juice displays the most powerful toxic activity at the moment of flowing into the duodenum. The bile, on the other hand, plays a physiologic part by inhibiting this toxicity of the pancreatic secretion. In fatal cases, the toxic substances formed in the duodenum by activation of the pancreatic juice are absorbed through the mucous membrane and gain entrance into the circulation, the inhibiting activity of the bile being inadequate.

**TREATMENT.**—Contrary to views quoted above, Gatch, Trusler and Ayers (Amer. Jour. Med. Sci., May, 1927) hold that when, in acute simple obstruction of the small intestine, the bowel wall remains intact, death is not due to toxemia. The lethal factors are *dehydration, reduction of blood chlorides* by vomiting, and *starvation*. Administration of **sodium chloride** and **water** by **hypodermoclysis**, or by any method which preserves the salt and water balance, will prolong life through the period of starvation. In acute strangulation of the bowel, the factor of toxemia is added.

In 3 cases observed by Lion (Bull. Soc. des chir. de Paris, Feb. 17, 1928) of late intestinal obstruction, in which the patients were moribund from toxemia, **intravenous injection of hypertonic sodium chloride solution** had a remarkable, almost instantaneous, effect in all 3, thus making operation possible. Additional injections were followed by marked evidence of detoxication and improvement. All 3 patients made an uneventful recovery. The author estimates that 1 Gm. (15 grains) of sodium chloride per kilogram ( $2\frac{1}{5}$  lbs.) of body weight is a sufficient daily dose. He employs the follow-

ing method: An intravenous injection of 20 c.c. (5 drams) of a 20 per cent. solution of sodium chloride is given every 4 hours for 6 doses. One liter (quart) of **physiologic sodium chloride solution** is injected subcutaneously. Orr and Haden (So. Med. Jour., Apr., 1926) also observed a definite therapeutic benefit from the administration of **sodium chloride** in pyloric and intestinal obstructions, the blood chemical determinations being consentaneously restored to normal.

J. C. White and E. M. Bridge (Boston Med. and Surg. Jour., June 2, 1927) hold similar views. As the fall of chloride in the tissues parallels that in the blood, and as the loss of chloride from the blood and tissues corresponds with the total amount lost through all channels of elimination, only the administration of both chloride and water can prevent a fatal alteration in the chemical equilibrium of the blood and tissues.

A. Chenut (Jour. de med. de Bordeaux, Feb. 25, 1927) reports the case of a woman, aged 45, who developed intestinal obstruction following hysterectomy. On account of a coincident bronchopneumonia, enterostomy appeared an extremely grave undertaking. Therefore, spinal **anesthesia** was tried. A preparation of cocaine was injected into the spinal canal between the 2d and 3d lumbar vertebrae. This resulted in the immediate discharge of gas and feces. The treatment was followed by **purgation** for a few days, and the patient recovered completely. Spinal anesthesia should be used only in cases in which tonic contraction of the intestine is responsible for the obstruction.

Pande (Indian Med. Gaz., Mar., 1926) reports 27 cases of intestinal obstruction, acute and chronic, in which he gave tincture of **belladonna** in 30-minim (1.9 c.c.) doses every

hour till physiologic symptoms appeared, when, after **physostigmine** and **pituitary extract** are given, the intestines do not start acting. When the intestines did not act automatically, **enemas of soap suds** in lukewarm water were given frequently, and also at intervals, **high rectal enemas** to which a liberal amount of **castor oil** or **sweet oil** had been added. This facilitates the easy passage of a hard fecal mass which may be acting as a plug. If the belladonna is not well tolerated owing to extreme sensitiveness of the stomach, hypodermic injections of **atropine** should be first started and then followed by belladonna by the mouth.

In a case of paralytic ileus following hysterectomy reported by H. Hartman and W. Dock (Jour. of Lab. and Clin. Med., Feb., 1927), the patient was given 0.6 Gm. (10 grains) of **choline hydrochloride** intravenously in 250 c.c. ( $\frac{1}{2}$  pint) of physiologic salt solution, over a period of 20 minutes. Immediately after the injection peristalsis began, and in about 5 minutes the patient passed, without cramps, a large quantity of gas and liquid feces. He died in 12 hours, however, and at necropsy a partial obstruction without gangrene was found high in the jejunum, which had herniated into the abdominal wound.

Acute obstruction *following surgical operations* is frequently encountered. In 95 cases in which K. A. Meyer and W. A. Brams (Ill. Med. Jour., Jan., 1927) had resorted to surgical removal, obstruction was due to post-operative adhesions or bands in 78 per cent. The obstruction occurred from a few months to 19 years after operation, and the great majority of these cases had been free from symptoms until the onset of the actual obstruction. More than half of the

obstructions followed operations were due either to appendectomy or to a pelvic operation. There was a striking freedom from obstruction following operation in the upper half of the abdomen. A large number followed so-called clean operations. The lower portion of the ileum was involved in 70 per cent. of the cases, and the usual location of the obstruction was in the right lower quadrant of the abdomen. A characteristic of the pain was its intermittent, colicky nature in the early stages before peritonitis appeared. Genuine fecal vomiting was never present, but a foul odor and vomitus which was apparently feculent occurred in 25 instances. Peristalsis, either visible or audible, was present in 67 cases. Roentgen-ray examination was not of great help. The mortality was 41 per cent., and there was a marked increase after the 3d day. The treatment consisted essentially of **gastric lavage** and forced administration of **saline solution** before and after operation. Removal of the obstruction or of the gangrenous area was attempted only when the general condition of the patient was good. Simple **enterostomy** alone was performed when the general condition was poor, and more detailed operative procedures were left for a somewhat later date after the toxicity had been reduced and the general condition of the patient improved.

**INTESTINES.—TUBERCULOSIS.**—According to Charrier (Bull. méd., Oct. 15, 1927), the onset of *ileo-cecal tuberculosis* may be marked by enteralgia, enteritis, occlusion, or perforation. The first named is by far the most frequent. The disease may

be of the hypertrophic, the ulcerocaseous or the localized form. If occult blood and tubercle bacilli are found in the stools, radiologic examination revealing ileal stasis with dilatation and the presence of opaque fluid 6, 8 or 10 hours after a meal, emptiness of the cecum and a part of the ascending colon, and colic hyperkinesia, supports a diagnosis of ileocecal tuberculosis. Clinically, the diagnosis is often difficult at the beginning, before the appearance of the tumor.

W. C. Davis (U. S. Vet. Bur. Med. Bull., July, 1926) urges that routine X-ray examinations of all patients with active pulmonary tuberculosis be practised, as X-ray evidence is the earliest obtainable. Such a confirmatory diagnosis and **heliotherapy** have revolutionized the outlook in *ulcerative intestinal tuberculosis*.

Of 300 patients studied with the X-ray, by H. B. Williams and L. U. Gardner (*ibid.*, Mar., 1928), 283 proved to be suffering from pulmonary tuberculosis; the remaining 17 non-tuberculous persons served as controls to the method of examination. Of the 283 tuberculous cases, 39, or 13.7 per cent., showed X-ray evidence of ulcerative colitis; 244, or 86.2 per cent., did not give any evidence of such involvement.

Most important for the X-ray diagnosis of intestinal tuberculosis, according to Hammer (Deut. med. Woch., Jan. 13, 1928), are the evidences caused by pathologic changes in the intestinal wall. Pointed or wavy irregularities in the contour are evidence of ulcerative tissue defects. Rigidity of the wall, accompanied by obliteration of the haustra, narrowing of the lumen and reduced extensibility,

is a manifestation of infiltrative processes in the intestinal wall. The ulcer ring shadow can be taken as indicating an ulcer filled with barium residue.

**PATHOLOGY.**—The histologic changes in the tuberculous intestine and the pulmonary changes were studied by H. Glatz (Zeit. f. Tub., Dec., 1927) in 50 cases, macroscopically and microscopically. The productive, the exudative and the caseous forms of the disease could be histologically distinguished in the intestine. The changes in the intestine were similar to those in the lungs.

**TREATMENT.**—Contrary to the usual teaching, Charbrut (Jour. de chir., xxx, 656, 1927), in a study of 40 cases in Hartmann's clinic, found that ileocecal tuberculosis is rarely primary, usually being secondary to tuberculosis elsewhere. This explains the high mortality from causes other than the intestinal lesion. The late recurrences are probably re-infections from the pre-existing primary focus. The immediate recurrences signify that ileocecal tuberculosis is not a strictly localized lesion and that overlooked foci in adjacent loops of bowel may lead to a continuation of the disease. Therefore, before **resection** is begun, a careful exploration should be carried out in every case in order to determine the extent of the process and the limits of operability.

In a review of the cases of tuberculosis of the intestine seen in Hoehnegg's clinic from 1904 to 1925, Fuchs (Beitr. z. klin. Chir., cxxxvi, 514, 1926) states that of the 116 patients, 87 were operated on. In the majority the symptoms were those of chronic ileus. In 61 cases the operation was for stenosis. **Unilateral ileo-**



cecal resection was performed 12 times, with successful results of 2 to 9 years' standing in 7 patients, and 1 death. Total exclusion of the intestine was carried out on 13 patients, with 3 lasting successes.

Of 29 enteroanastomoses, 5 gave successes of 2 to 20 years. The total mortality of operations for intestinal stenosis was 12 cases. Total exclusion brought about improvement of the local process in all.

**IODINE.—PHYSIOLOGIC ACTION.**—Grabfield, Gray, Flower and Knapp (Jour. of Clin. Invest., Aug. 20, 1927), in a comprehensive study in dogs, found that a 27 per cent. increase in the daily nitrogen excretion on a constant diet followed the subcutaneous injection of a solution of sodium iodide. This increased nitrogen output was not accompanied by an increase in sulphur excretion. It did not occur after the removal of the thyroid gland in 2 dogs. This shows that the thyroid gland is necessary for the mobilization and excretion of this nitrogen following the administration of iodides. The authors suggest that the thyroid may have as one of its functions (apart from its effect on the basal metabolism) the mobilization of "deposit nitrogen" poor or lacking in sulphur. Sustaining the importance of the thyroid gland in nitrogenous metabolism is the experimental observation of Maurer, Ducrue and Palasoff (Münch. med. Woch., Feb. 18, 1927) that iodine is present in most of the organs in a concentration about 6 times higher than that in the blood. The suprarenal, and especially the ovary, were found to have the largest iodine content. In newly born girls the latter gland ranks almost as high as the thyroid. Maurer and Diez (*ibid.*, Jan. 1, 1926), moreover, found that there was a regular increase in the iodine content of the blood on the first day of menstruation (average 0.0193 mgm. per 100 c.c., as against 0.0092 in the interval).

Greenbaum and Raiziss (Jour. of Pharm. and Exp. Ther., Mar., 1927), from laboratory findings, state that iodides of the

alkali metals, administered to animals in single massive doses by mouth, are eliminated in the urine almost quantitatively in a short time. The excretion of potassium iodide occurs within 5 to 6 days, and that of sodium iodide, in 3 to 4 days. With both iodides, the greatest proportion of the iodine is excreted during the first 24 hours. After this period the daily elimination is very small. Potassium iodide seems to be eliminated by the kidney with greater difficulty than sodium iodide, and sometimes causes temporary retention of iodine in the body. Only traces of iodine were found in the feces. The elimination of calcium iodide gives entirely different results. When administered orally, at least 50 per cent. of its iodine content is eliminated in the urine, while the remainder is found in the feces, and the greater portion of the iodine is eliminated during the first 24 hours.

The administration of iodine to cows, according to Strobel, Scharrer and Schropp (Biochem. Zeit., Jan. 29, 1927) in daily doses of 1.53 or 3.82 mgm. ( $\frac{1}{40}$  to  $\frac{1}{16}$  grain) increased their milk-giving capacity. No unfavorable effects were observed. The percentage of fat was somewhat decreased. The specific gravity of the milk remained the same. Whether the same effect was produced in the human female was studied by Maurer and Ducrue (Münch. med. Woch., Feb. 10, 1928). To ascertain whether a single large dose of iodine would affect the composition of breast milk, a wet nurse, after preliminary examination for 3 days, was given a dose of 0.6 Gm. (10 grains) of potassium iodide. In the days following, there was a marked increase of the iodine content of the milk and the body lost in this way in the first 3 days 68 mgm. ( $1\frac{1}{20}$  grains) or about 15 per cent. of the amount of iodine administered. On the 5th day, the iodine content had not yet fallen to normal. Even after an unusually high dose of iodine there is no more injurious influence on lactation than a decrease of the fat content in proportion to the amount of iodine administered.

According to Grumme (Schweiz. med. Woch., Dec. 31, 1927), ordinary and small doses of an iodine protein compound stimulate the activity of the mammary glands; larger doses check it. Unlike potas-

sium iodide, this compound does not produce symptoms of iodism. It seems possible to increase the iodine content of milk by feeding a suitable iodine preparation to cattle, and thus preserve infants and young children from goiter.

**UNTOWARD EFFECTS.**—A dangerous feature attending the use of potassium iodide, well known to laryngologists, was emphasized by a case observed by Snell and Savin (*Lancet*, Apr. 9, 1927). The patient, a woman, was given 15 grains (1 Gm.) of potassium iodide at night and a total of 25 grains (1.62 Gm.) the next morning. She became very dyspneic, and laryngoscopy showed edema glottidis. The same evening a rapid tracheotomy had to be performed, the patient being unconscious and near death; operation, however, insured recovery.

The intratracheal injection of *iodized oil* proved fatal in a case observed by O'Donovan (*Brit. Med. Jour.*, Nov. 19, 1927). The patient developed an eruption which was one of the recognized types of rash that may follow absorption of iodides. He died from bronchitis and heart failure 10 days after the injection of iodized oil.

### IODIZED OIL IN X-RAY DIAGNOSIS.

—Lipiodol, as iodized oil is frequently termed, is now used in many disorders, in most cases with impunity, as Ballons (*Can. Med. Assoc. Jour.*, Apr., 1927) states. He urges, however, that it be not injected in cases of pulmonary tuberculosis of the exudative type nor in tuberculous pneumonias, as immediate reactions are produced and its persistence causes ill-effects. Selected cases of the surgical type of pulmonary tuberculosis are usually suitable for injection, and do not produce reactions. Some of the indications mentioned by S. Pritchard, B. Whyte and J. K. M. Gordon (*Radiol.*, Feb., 1927) for the bronchial injection of iodized oil are: Chronic cough associated with chronic infection in the upper respiratory tract, sinusitis particularly; cough with purulent expectoration in the presence of a history of a previous pneumonia or the inspiration of an organic foreign body; long-standing cough with little if any expectoration in the absence of frank pulmonary disease; obvious bronchiectasis, for

the purpose of mapping the diseased area; bronchial fistulas, and as a therapeutic agent. The authors have used the oil in 1000 cases, with slight untoward effects in only 6 cases. Mild iodism occurred in the form of an irritable rash appearing about 48 hours after administering the oil. Contraindications to its use are: Acute conditions such as colds and influenza; acute active tuberculosis; very extensive and advanced pulmonary suppurations, particularly when the patient is extremely weak; advanced circulatory complications, such as angina pectoris, aneurism, cardiac decompensation, and recent hemoptysis.

Untoward effects have been reported. In 13 cases observed by Ebaugh and Mella (*Amer. Jour. Med. Sci.*, July, 1926), the subarachnoid injection of lipiodol produced a fairly severe aseptic meningitis. These changes were transient and should not contraindicate the use of lipiodol to supplement preliminary neurologic examinations. The systemic effects noted in several cases likewise were transient. No prolonged subjective complaints or permanent residua have followed the procedure.

**ISACEN.**—This laxative and purgative agent, first produced by M. Guggenheim in 1925, is a compound rather similar to the anthraquinone glucosides, emodin and chrysophanic acid, and is chemically diacetylbisoxypheylisatin. It is insoluble in acids and water, and has no action in the stomach. In the alkaline duodenum, however, it is saponified and splits off bisoxypheylisatin, which stimulates intestinal peristalsis. The drug possesses the advantage over phenolphthalein in that it is practically unabsorbable, giving no color reactions in the urine after large doses; this minimizes the likelihood of any harmful effect on impaired kidneys or liver. It is non-toxic in doses even greatly in excess of those therapeutically required, and 1 Gm. of it has seemed quite harmless in experimental animals. In pregnancy and lactation isacen is claimed to be preferable to other laxatives from the standpoint of safety to the mother and child.

The drug is marketed in tablets each containing  $\frac{1}{3}$  grain (0.005 Gm.). The dose is 2 to 4 tablets, or more if necessary. In some patients even a single tablet,

taken at bedtime, suffices to produce a satisfactory soft evacuation the next morning; in most instances, however, 2 tablets are required.

Among 47 elderly women suffering from **constipation** to whom 1 tablet was given 2 to 4 times daily by M. Einhorn and H. A. Rafsky (Jour. Amer. Med. Assoc., June 5, 1926), in 39 nothing else was required to

keep the bowels tolerably regular. Twenty-eight were entirely free of pain or colic while using the drug. The number of movements fluctuated from 1 to 2, seldom 3 or 4, a day. All of the 47 persons treated by Einhorn and Rafsky were more or less chronic invalids, in whom a laxative remedy would be expected to be less effective than in healthy subjects.

## J

**JAUNDICE.—HEMOLYTIC.**—In a case of severe hemolytic jaundice in a boy, aged 5, observed by Knauer (Jahrb. f. Kind., Nov., 1926), the hemoglobin was 27 per cent. and the erythrocytes, 1,400,000. Intravenous **blood transfusions** had only a transient effect. The patient recovered after **splenectomy**. The hemoglobin and erythrocyte count reached normal, the resistance of the erythrocytes increased, and microcytes and granular erythrocytes almost disappeared from the blood. Histologic examination of the spleen revealed an exceptionally high grade hyperemia.

As regards treatment, Jacobi and Naegeli (Mitteil. a. d. Grenzgeb. d. Med. u. Chir., xxxix, 270, 1926) warn against roentgen irradiation of the spleen in hemolytic jaundice. It may entail adhesions that may cause difficulties in **splenectomy**, which is the only rational treatment.

**INFECTIOUS AND HEMORRHAGIC.**—Infectious jaundice was observed in 14 cases by Musser and Miangolarra (N. O. Med. and Surg. Jour., Aug., 1926) at the time of year (fall) in which epidemic jaundice is likely to occur. The history in 6 cases showed that there had been direct contact with some person who had an attack of jaundice. Such con-

tact apparently played the leading rôle in this mild epidemic, as no other etiologic factor could be discovered. An outbreak of jaundice of undoubted infectious nature was observed in Scotland by Mackie and McLachlan (Edin. Med. Jour., Aug., 1927) in 7 young persons in 2 families. While the illness was of exceedingly mild type, the bacteriologic examination pointed clearly to its spirochetal origin.

According to A. W. Sellards (Ann. of Trop. Med. and Parasitol., July 22, 1927), yellow fever and *Weil's disease* are similar in their symptomatology and typical examples of an acute infectious jaundice. Yet, the 2 diseases are fundamentally different in their etiology, epidemiology and pathology. The differentiation of Weil's disease from other types of infectious jaundice can ordinarily be accomplished easily by means of the *Pfeiffer reaction* with leptospira. If the serum of a patient convalescent from an acute infectious jaundice gives a positive Pfeiffer test with leptospira, using either *L. icterohæmorrhagiæ* or *L. icteroides*, then yellow fever can be excluded and the diagnosis of Weil's disease is justified.

A. C. Guthrie (Lancet, Feb. 12, 1927) urges that in all cases of jaun-

dice, however mild, examination of the blood for spirochetes should be a routine measure. If they are not found, the blood cells should be examined for degenerative changes, and if these are present, the agglutination test with stock spirochetes should be performed at once; if this is found positive, the antiserum for this disease should be injected without delay. This treatment has been found wonderfully effective in the early stages.

Van Gelder (Ned. Tijds. v. Gen., July 31, 1926), confronted with a severe case of Weil's disease in Holland, sought for other cases in the environment, and found *Spirochæta icterohæmorrhagiæ* in a total of 11 cases. The first 4 were severe, 3 patients dying. None presented enlargement of the spleen, and the later cases were recognized only by their epidemiologic connection with the early severe ones. Six of the patients were known to have been swimming at Delft in water swarming with rats. The rats examined showed *S. icterohæmorrhagiæ* in all, or guinea-pigs inoculated with material from them developed typical Weil's disease. Of 51 wild rats caught in Baltimore by Walch and Walch-Sorgdrager (Amer. Jour. of Hyg., July, 1927), 17 harbored *Leptospira icterohæmorrhagiæ* and 6 were carriers of virulent strains. The authors recall that Levaditi sections of the kidneys may reveal leptospiras when smears examined by the dark field fail to show them.

In Sumatra, Baermann and Smits (Ned. Tijds. v. Gen., Dec. 10, 1927) studied a group of febrile illnesses with spirochetes in the blood that they found occurring with frequency in a rubber district. They made

agglutination tests with known spirochete strains from Europe and conclude that these cases, hitherto classified as "spirochætosis febrilis," are all caused by the spirochete of Weil's disease. The illnesses varied from mild to severe, but the authors regard them as constituting a clinical entity, identical with Weil's disease. Long contact with stagnant water or mud, either direct or indirect, as through wet clothing, preceded the onset of the disease.

Uhlenhuth and Herrmann (Med. Klin., Apr. 22, 1927), continuing investigations started with Zuelzer, succeeded again in transforming saprophytic spirochetes obtained from water and grown on mediums containing rabbit's or rat's serum into typical spirochetes of Weil's disease. Even the immunologic properties changed. Part of their experiments were carried out by first passing the strain through rats, while part were done directly on guinea-pigs.

Bönnig (Münch. med. Woch., Sept. 23, 1927) refers to the case of a man who fell in a ditch and swallowed much ditch water. Weil's disease developed and proved fatal. He assumes that the ditch water was infected with *Spirochæta icterogenes* from the urine of infected rats. The connection between the accident and the man's death was affirmed in the court testimony.

#### TREATMENT AND PREVENTION.

—According to Sazerac, Nakamura and Kitchevatz (Bull. de l'Acad. de méd., July 26, 1927), sodium tartro-bismuthate possesses a remarkable curative power in *Leptospira icteroides* infection in the guinea-pig. The action of bismuth on *L. icteroides* and *Spirochæta icterohæmorrhagiæ* appears to be identical. It is not illogical to suppose that icterohæmorrhagic spirochetosis and yellow fever are different forms of infection provoked by



the same original virus which has undergone still undetermined modification. Hence, the possibility of treating yellow fever successfully with bismuth compounds. Sazerac and Nakamura (*ibid.*, May 31, 1927) studied the preventive value of bismuth in icterohemorrhagic spirochetosis. Four guinea-pigs were injected with **sodium bismuthotartrate** 2 days after an inoculation with *Spirochæta icterohæmorrhagiæ*. The inoculation was repeated 3 weeks later. The animals were still alive after 14 weeks, while the controls died in 6 to 8 days. The immunity against the spirochetal infection persisted up to 5 months after the first inoculation. The authors suggest trying the action of bismuth in the prevention and treatment of the disease in man.

Timmerman (Ned. Tijd. v. Gen., Mar. 26, 1927) advocates immune **rabbit serum** given intravenously, unless the case be already far advanced, when the arterial route is preferable. The initial dose should be 30 c.c. (1 ounce).

**OBSTRUCTIVE.**—A. R. Short (Lancet, Dec. 10, 1927) states that obstructive jaundice may occur without either gall-stones, malignant new growths, or cirrhosis of the head of the pancreas. Patients belonging to this group are usually young women, and the jaundice is persistent, but pain is not conspicuous. In 3 cases, all verified by operation, the cause was found and removed, the jaundice disappearing in each case. Two of the patients had enlarged lymphatic glands pressing on the common bile-

duct; these were tuberculous in 1 case and simple inflammatory in the other. The 3d case showed what the author terms "vateritis."

According to C. S. Wallace (Practitioner, June, 1926), when the surgeon is faced with a very large gall-bladder and distended bile-passages, marked temporary relief can be produced by **drainage of the gall-bladder**. External drainage being abandoned, it is only a question as to whether the gall-bladder should be anastomosed to the stomach or the duodenum. It does not appear to matter which of these organs is selected for the opening as the discharge of bile into the stomach seems to produce no disturbance of digestion. The surgeon can choose the stomach or duodenum, according to which organ offers the easier operation.

**ICTERUS NEONATORUM.**—H. M. Greenwald and W. Messer (Amer. Jour. Med. Sci., Dec., 1927) observed a case of familial icterus neonatorum gravis with recovery, the first 2 infants of the same mother having suffered from this disease with fatal termination. Symptoms pointing to an involvement of the central nervous system, as evidenced by spastic diplegia and idiocy, developed subsequently.

According to R. Taylor (Amer. Jour. Dis. of Childr., Dec., 1927), in infants born prematurely the *bile index* remains high for weeks or even months after manifest icterus neonatorum has disappeared. The normal index which is then reached is definitely lower than the normal index for the adult.

## K

**KALA-AZAR (LEISHMANIASIS).**—According to Shortt, Das and Lal (Indian Jour. of Med. Research, Oct., 1927), parasites in the peripheral blood can be found in proved cases by direct microscopic methods in 78.7 per cent., without prolonged examination.

Concerning the *transmission* of the disease, Shortt, Barraud and Craighead (*ibid.*, Jan., 1927), using 60 experimental animals, subjected them to 184 bites from a minimum of 152 *Phlebotomus argentipes* known to be infected with *Leishmania donovani*. In no case, however, did kala-azar develop. The authors believe that it is not that *Phlebotomus argentipes* cannot transmit the disease by its bite, but that the experimental animals used were not sufficiently susceptible to *L. donovani* to become infected, except as the result of a more intensive exposure to infection than that to which they were subjected experimentally. Young and Hertig (Proc. Soc. Exper. Biol. and Med., June, 1927), in another set of transmission experiments, found that although sandflies infected with *Leishmania* may produce infections in hamsters when inoculated intraperitoneally, all efforts made by them to transmit the infection to hamsters by their bites failed.

Mazza and Arias (Rev. de la Soc. Argent. de biol., Apr., 1926) witnessed the first reported cases of infantile kala-azar in Argentina. They occurred in children aged 5 and 9 years. The diagnosis was aided by the irregular outline of the hypertrophied spleen, its hardness and resistance, and lack of tenderness. The

hypertrophied spleen of malaria, on the other hand, enlarges evenly, losing its original lobulation. The lack of any influence from quinine and the prompt improvement under **antimony and potassium tartrate** confirmed the diagnosis.

R. Brooke (Amer. Jour. of Trop. Med., Jan., 1927) observed a case of kala-azar in Panama. The diagnosis was corroborated by finding the parasites in the material obtained by splenic puncture. Treatment with **antimony and potassium tartrate** proved eminently satisfactory.

**KELOID.**—In a girl of 22 years, reported by Vollmer (Derm. Woch., Sept. 3, 1927), syphilitic infection of the tonsil treated by non-specific proteins developed to the stage of extensive necrosis. Though treated actively with arsphenamin, a keloid developed.

G. M. MacKee and J. J. Eller (Phys. Therap., July, 1926) obtained rapid cure of a large keloid by the combined use of the **endotherm knife** and small doses of **roentgen rays**.

**KIDNEY.—TESTS.**—The various laws of kidney function extant were analyzed by B. S. Walker and A. W. Rowe (Amer. Jour. of Physiol., Aug., 1927) in normal and nephritic subjects, to ascertain their actual validity. The 1st law of Ambard was found to be correct, but only within certain rather narrow limits. At best, it could be regarded only as a rough approximation. The 2d law of Ambard was found to be completely invalid, thereby confirming the conclusions of earlier investigators. The 3d law of Ambard—a combination of the first 2—was found to offer results which correlate approximately with the known conditions of renal function.

In the London Hospital, 3 tests—blood urea, urea concentration (MacLean), and

phenolsulphonphthalein—have been used for more than 4 years. The results summarized by J. Marrack and S. Robinson (Lancet, Aug. 21, 1926) served to illustrate the value of the *blood urea estimation*. The *urea concentration test* was found of some value to supplement the blood urea test, particularly in those cases in which the blood urea has fallen after treatment. Satisfactory conclusions could be drawn only from the *phenolsulphonphthalein test* when the results were high and as certain evidence of sound kidneys. The test was found disappointing, however, owing to the frequent occurrence of low results even though the kidneys appeared to be sound.

Many conditions tend to pervert the findings in renal function tests, according to Heusch (Arch. f. klin. Chir., Mar. 31, 1927). The quantity of urine excreted is modified by any factor that alters blood-pressure or that influences water excretion by other eliminatory organs, as well as by the capacity of the tissues to hold water, which varies in different persons. The mechanism of excretion of nitrogen by the kidneys is complex and is governed by numerous physiologic factors. All of these factors must be investigated before a renal function test can approximate accuracy. To test the working capacity of the kidney is a more realizable, though more modest, aim. The *water test* (forced polyuria) provides information that is of use to the clinician, particularly the surgeon. Injection of *dyes* and the use of the cystoscope are valuable auxiliaries. The writer warns, however, against assuming any parallelism between excretion of dyes and excretion of nitrogen. Ureteral catheterization is a failure when applied to examining renal function. The urine obtained by its aid differs quantitatively and qualitatively from normally eliminated urine. The more deeply we delve into the physiologic secrets of the organism, the further does the goal, to reduce to figures the functional capacity of the kidneys, recede. When to-day we say "kidney," we think "blood" and to understand the kidney, we must understand the patient.

#### TUBERCULOSIS.—SYMPTOMS.

—In 213 cases analyzed by Runeberg

(Finska Läk. Handl., June, 1926), the renal symptoms had existed over a year before tuberculosis of the kidney was suspected. The onset was insidious in 70 per cent. The 1st symptom was disturbance in micturition in 74 per cent.; pain in the lumbar region in 16.3 per cent.; hematuria in 5.8 per cent.; in 2 cases, pyuria, and in 3, emaciation. The bladder was found normal in 33 per cent. of those presenting "cystitis" symptoms as the 1st manifestation. Local measures against this "cystitis" proved distinctly dangerous, besides being useless. The urine reaction was acid in 96 per cent. of the cases. Albuminuria and pyuria were practically constant. The irregular outlines of the pus cells, in contrast to pus from other infections, aided in the diagnosis (Colombini). In 15 cases no bacteria could be found in the acid, pus-containing urine. The author denies that this is pathognomonic for renal tuberculosis. In fact, tubercle bacilli can be eliminated through the sound kidney. He reports a case that confirms this; both kidneys eliminated tubercle bacilli, but since removal of 1 kidney, the other has been functioning apparently perfectly. Fully 80 per cent. of the **nephrectomized** patients were restored to health. One patient refused to allow removal of the kidney and she has spontaneously recovered—an instance of autonephrectomy. The disease has progressed in all the other cases without surgical intervention. In conclusion, the author warns that one should continue general treatment after the nephrectomy, as these patients are still tuberculous after the renal focus has been removed.

In keeping with Runeberg's last conclusion, G. J. Thomas and T. J.

Kinsella (Jour. of Urol., Apr., 1927) contend that every patient infected with tubercle bacilli is a candidate for renal tuberculosis. The physician and the patient may not notice any symptom indicating this infection, but repeated urologic examination, including complete urinalysis and animal inoculation, will reveal many unsuspected cases. Tissue destruction with renal tuberculosis or renal phthisis is a late lesion most frequently encountered by the surgeon. Renal infection with tuberculosis is through the blood-stream. Bilateral infection is the rule and may end in clinical arrest or cure. **Sanatorium treatment** is necessary if renal tuberculosis is to be arrested or cured. This applies after the surgical removal of 1 kidney, as well as when both organs are diseased.

**DIAGNOSIS.**—According to W. M. Kearns (Radiol., Aug., 1927) the *pyelogram* in renal tuberculosis is rarely necessary; it often lacks reliability, and is attended with danger.

An *early cystoscopic sign* of renal tuberculosis is suggested by Jeans (Brit. Med. Jour., Dec. 3, 1927). It is a rebound of the colored urine on the pathologic side (methylene blue or indigo carmine being used), caused by the stream impinging on the lower edge of the ureter opening where it is slightly raised, hardened and thickened.

To ascertain the diagnostic value of *guinea-pig inoculations*, H. D. Morse and Braasch (Jour. of Urol., Mar., 1927) used 8 of a series of 45 cases of proved renal tuberculosis. The guinea-pig reactions were negative in all. This discrepancy is explained by the authors thus: (a) The inherent defensive mechanism of guinea-pigs varies

according to the number and type of bacilli injected; (b) the fibrosis and encapsulation of the infected area in the patient; (c) the appearance of *Bacillus tuberculosis* in showers, so that at intervals the urine may be free from it. In 109 cases of proved renal tuberculosis in which 1 kidney was apparently healthy, guinea-pig inoculation was positive in only 18 per cent. The authors conclude, therefore, that the diagnosis of renal tuberculosis should not be decided from guinea-pig inoculation alone. Other laboratory or cystoscopic aids should be used to establish it. In order of importance these are *urography*, *microscopic study of catheterized ureteral specimens*, *cystoscopic data*, *clinical data*, and, particularly, *examination of the genitalia*.

**TREATMENT.**—When renal tuberculosis cannot be treated surgically, *i.e.*, by **nephrectomy**, **nephrostomy**, or **cystostomy**, Larget and Lamare (Bull. méd., Oct. 15, 1927) recommend careful diet, tonics and **methylene blue** and treatment of the bladder by **instillations**. They have used injections of **Vaudremer's vaccine** in 6 cases with apparent benefit. Instillations of vaccine diluted with physiologic saline solution are of value in vesical lesions. The use of vaccine, however, is contraindicated when there are concomitant pulmonary lesions in evolution or even fibrous pulmonary tuberculosis.

II. Blanc (Paris méd., Aug. 7, 1926) recommends **methylene blue**. This dye being chiefly eliminated by the kidneys, it impregnates them as well as the other urinary structures, where it exerts an antiseptic and sedative influence on inflamed tissues. It is of benefit in all cases of tuberculosis



of the urinary tract. He prescribes pills each containing 0.05 Gm. ( $\frac{3}{4}$  grain) of methylene blue, twice a day with meals. The treatment may be continued for a long time, with a 10-day rest every month, and greatly ameliorates the cystitis. A 1 per cent. solution of methylene blue in saline solution is used for local treatment. Usually 5 c.c. (80 minims) of the solution are injected into the bladder every other day. Sometimes 2 c.c. (32 minims) are 1st injected, and the dose then gradually increased to 10 c.c. ( $2\frac{1}{2}$  drams).

Thomson-Walker (Brit. Med. Jour., Oct. 8, 1927) contends that tuberculosis of the kidney cannot be cured by exposure of the patient to **sunlight**, even though cases have been recorded in which the pus and tubercle bacilli have disappeared from the urine for some years after this treatment. Knowledge of the pathologic changes of renal tuberculosis shows that temporary occlusion of a tuberculous focus may take place without this treatment, but that sooner or later the tuberculous disease progresses and destroys the kidneys. Wildbolz (Schweiz. med. Woch., June 26, 1926) also warns against

considering a patient with tuberculosis of the kidney as cured when the urine becomes normal, even if the diseased kidney secretes almost normally.

**Surgical Treatment.**—According to statistics quoted by A. Fullerton (Brit. Med. Jour., Oct. 8, 1927), **operation** remains the most hopeful method of treatment in tuberculosis of the kidney. If it is done early, before deep ulceration has taken place in the bladder, relief is often immediate. Even in late cases, if the other kidney is sound, the patient may still be cured. Deep ulceration of the bladder, and the presence of tubercles in that organ, render the prognosis less hopeful, especially as regards the relief of frequency of micturition. Even if healing occurs, the scarred and contracted bladder is unable to expand, and the patient is obliged to empty it at frequent intervals.

Westerborn (Arch. f. klin. Chir., Mar. 30, 1926) reports recovery after **nephrectomy** in 40 per cent. of the men and 73.2 per cent. of the women (121 cases). He saw miliary tuberculosis developed shortly after catheterization in 7 patients—mostly with strictures.

## L

**LABOR.—ANESTHESIA.**—General anesthesia by means of **gas-oxygen** is advocated by C. H. Davis (Amer. Jour. of Obst. and Gyn., Dec., 1927), who found it satisfactory for most operative deliveries except those requiring a considerable degree of relaxation such as version. For these, **ether** may be added to the mixture, but it is rarely needed when **ethylene-**

**oxygen** is employed. Cesarean section may be performed with local anesthesia, combined anesthesia or ethylene-oxygen. **Caudal anesthesia** or **sacral nerve-block** is advised for patients with severe pulmonary cardiac and renal complications, with or without toxemia.

**Pudendal anesthesia** was used by W. Schmidt (Zent. f. Gyn., Sept. 10,

1927) in 50 cases of spontaneous birth, 30 cases of suture of perineal laceration and episiotomy incision, and 20 cases of forceps delivery. He injects 20 c.c. (5 drams) of a 1 per cent. solution of **procaine hydrochloride** with **epinephrine**. His results improved after he included in the injection the posterior cutaneous femoral nerve. In spontaneous labor the cervix should be fully dilated when the injection is made. He obtained complete anesthesia of the external soft parts and absence of pain from stretching during the passage of the head, while the pain of the contractions remained. He found the procedure especially valuable in old and in very young primiparæ, and where some measure of anesthesia is required but a general anesthetic is contraindicated.

Aufermann (*ibid.*, Apr. 24, 1926) injected intravenously 0.02 Gm. ( $\frac{1}{3}$  grain) of **morphine** in over 100 parturient women. The action lasted  $2\frac{1}{2}$  to 3 hours. If the pains became weaker, **pituitary** preparations were added.

**Spinal anesthesia** was used by Balard and Mahon (*Presse méd.*, Mar. 7, 1928) in the so-called spasmodic rigidity of the cervix during labor, but they found it insufficient. When it is a question of *muscle spasm*, and not pathologic rigidity, spinal anesthesia was found to be a specific, especially when—the cervix being completely effaced and dilatation begun—a rapid termination of the labor is desired in the interest of the mother or fetus.

Cosgrove (*Amer. Jour. of Obst. and Gyn.*, Dec., 1927) used **spinal anesthesia** in 54 labor cases. All the patients except 4 were in active labor

at the induction of anesthesia. He found it a safe procedure. The only contraindication was hypotension. It is not fitted for 1st-stage analgesia by reason of its short duration. At the termination of the 2d stage by the vaginal route, it causes entire soft tissue relaxation. In selected cases this property may obviate lacerations or the necessity for episiotomy. The method may be used here for any condition contraindicating general narcosis; it is not recommended as a routine measure. In obstetric laparotomies it offers the same advantages that it does in general surgery, *viz.*, complete anesthesia, thorough muscular and visceral relaxation, relatively slight bleeding, minimal post-operative discomfort, and a smooth post-operative course.

**Rectal ether anesthesia** was used by Harrar (*ibid.*, Apr., 1927) in 580 cases of labor, with very satisfactory results. There were no ill results to the mother, and the usual disadvantages of other methods—perineal delay and asphyxia of the new-born child—failed to appear. There is no inhibition of good bearing-down efforts in the 2d stage, and there are no alarms regarding the respiratory condition of the child at birth.

L. L. Hoskins (*Ohio State Med. Jour.*, Apr., 1927) injects  $\frac{1}{6}$  grain (0.01 Gm.) of **morphine sulphate** in 2 c.c. ( $\frac{1}{2}$  dram) of a 50 per cent. solution of **magnesium sulphate**. From 20 to 30 minutes later, a mixture of **quinine sulphate**, 10 grains (0.65 Gm.); **alcohol**, 2 drams (8 c.c.); **ether**,  $2\frac{1}{2}$  ounces (75 c.c.), and **olive oil**, 4 ounces (120 c.c.), is injected into the rectum by means of a large glass syringe to which is attached a No. 17 catheter. The latter, well lubricated

with petrolatum, is inserted from 4 to 6 inches into the rectum, the time consumed being 1 to 2 minutes. As a rule, the patient is drowsy in 5 to 10 minutes, and in 15 to 20 minutes she is asleep. This form of analgesia can be used with comparative safety, hospitalization of cases not being necessary. Labor, as a rule, is prolonged in multiparæ, and also occasionally in primiparæ. Most primiparæ require 2 or more instillations if analgesia is to be afforded through the 2d stage of labor. The instillations are best omitted in multiparæ, or else given in reduced quantity unless a prolonged or difficult labor is expected.

McNeile and Vruwink (Cal. and West. Med., May, 1927) substituted **diallylbarbituric acid**, 3 grains (0.2 Gm.), for the morphine-magnesium sulphate in more than 200 patients. One ampoule containing this amount of the drug is given by hypodermic when the cervix is dilated from 2 to 3 finger-breadths and contractions are occurring at intervals of 3 to 5 minutes. If relief is not obtained in 15 to 20 minutes, the rectal instillation is given. The same treatment may be repeated in 3 to 4 hours. The effect sets in quite rapidly—as a rule in 15 to 20 minutes. The patient becomes somewhat sleepy, and this effect is increased after the rectal instillation. The tendency to sleep between pains becomes very pronounced. In nearly all patients the strength of the uterine contractions is increased and the interval decreased.

The literature concerning the various phases of labor contains no innovations, repeating in most instances facts familiar to well-trained obstetricians.

**INDUCTION OF LABOR.**—The induction of labor by the use of **pituitary** preparations remains, however, the liveliest topic. According to many, its use is attended with much danger to both mother and offspring. The tetanic contractions of the uterus, the resulting interference with the utero-placental circulation, sufficient in some instances to asphyxiate the child, the excessive compression of the head, and other untoward effects, have been such, in fact, as to lead many leading obstetricians, including Williams and Lee, practically to discontinue its use. On the other hand, as stated by Bruce-Bays (So. African Med. Rec., Dec. 25, 1926), the method has numerous advantages. The uterine contractions are more prolonged than those provoked by ergot. The action is directly upon the musculature, not through the agency of the nervous system. The chief indication for the procedure is during the 2d stage when, the cervix being well dilated or dilatable, the head being engaged, and there being no ascertainable disproportion between the maternal and fetal parts, nor any mechanical obstruction, the pains are becoming gradually weaker and less effective. In such a case, pituitrin can be employed with satisfactory results; within a few minutes, often not more than 5, it produces its effects, the contractions become powerful and frequent, and often the child is expelled within 15 minutes or less. One serious objection to pituitrin is the precipitate haste with which the fetus often appears, a haste which is difficult to control and which may lead to extensive perineal tear. Pituitrin should never be used before the head is well engaged or the cervix dilated. Labor

in cases of marked pelvic contraction is not suitable for pituitrin delivery. In many cases in which the os is slow in dilating, a good dose of **opium**, which gives rest to the patient and allows the uterus to regain its contractile power, is better than pituitrin. One advantage pituitrin has is that it exercises a powerful effect in reducing the amount of blood lost during the 3d stage and in lessening or abolishing the tendency to post-partum hemorrhage. So marked is this that a routine injection of 0.5 c.c. (8 minims) has been recommended after the expulsion of the placenta. Pituitrin should never be employed in patients in whom a Cesarean section has been performed; the strong expulsive efforts caused are very likely to reopen the old scar with disastrous effects. On the whole, while it is not to be denied that pituitrin has many advantages, its use carries with it a certain amount of risk and danger.

The recent observations of Scott and others having revealed that so far no method has been devised which is altogether free from danger to either mother or child—including Watson's method of sensitizing by giving **castor oil** and **quinine** and following it with **pituitary**—Hofbauer, Hoerner and Oliver (Amer. Jour. of Obst. and Gyn., Aug., 1927) tried the following technic: Twenty minims (1.25 c.c.) of **pituitary extract** are inserted under the anterior end of the inferior turbinate. At the end of 1 hour or 2 the pledget is withdrawn. If necessary, a fresh pledget is applied to the opposite nostril, thus leaving 1 nasal passage always free for breathing. It seems important that the pledgets be applied firmly to the inferior turbinate, and that if a 2d

pledget is found necessary it should be applied before the effect of the 1st one wears off. Among 56 cases in which the indications for induction of labor were toxemia, post-maturity, severe pyelitis, hydramnios or dead fetus, the procedure is reported as successful in every instance. Among 24 cases in which the method was tested in normal pregnant women during the last month of pregnancy and at term, there were 9 failures. All the babies were born alive. The method seems to be the safest available for obstetric purposes, as there is the possibility of withdrawing the drug and preventing further absorption should the uterus pass into tetanic contraction. Further experience, however, will be necessary before its use can be standardized.

According to W. R. Addis (Lancet, Feb. 26, 1927) a practically infallible method of induction of labor is to inject an **extract of ovarian residue** (P. D. & Co.), 1 c.c., into the pectoralis major muscle at the anterior border of the axilla. At 1st the uterine contractions have to be recognized by palpation, as the onset of labor is painless. The dose is repeated when the contractions begin to diminish in intensity and frequency, *viz.*, in an average time of about 3 hours. After the 2d injection, **castor oil**, 1 ounce (30 c.c.), is given by mouth. With this form of induction, the labor is almost painless throughout the 1st and beginning of the 2d stage, and pains are really only experienced when the perineum bulges.

H. Garcia San Martin (Rev. med. del Uruguay, Dec., 1927) refers to a death reported from uterine rupture apparently due to an injection of solution of pituitary by a midwife. In a



Montevideo obstetric service in 1924, out of 23 cases of ruptured uterus, 4 were caused by the unwise use of pituitary solution.

R. A. Scott (Surg., Gyn. and Obst., Nov., 1926) states that in the Evans-ton Hospital, during the preceding 3 years, 0.5 c.c. (8 minims) of **pituitrin** had been injected intramuscularly at the beginning of the 3d stage of labor as a routine procedure. The records of 1000 consecutive cases were reviewed and the results compared with 1000 earlier cases in which no pituitrin had been used. It was found that the pituitrin definitely shortened the 3d stage of labor. It lessened the amount of blood lost in this stage, both in spontaneous and operative deliveries. It lessened the number of cases of post-partum hemorrhage, and it diminished the frequency of retained placenta due to contraction ring.

#### LABOR IN HEART DISEASE.

—An influence of a heart disorder on *presentation* seems to have been exemplified in a woman of 36 whom Gonet and Bouget (Bull. Soc. d'obst. et de gyn. de Paris, xvii, 263, 1928) attended in her 12th delivery. Before the heart lesion developed there had been 3 normal deliveries at term. In the 9 pregnancies after the heart lesion, however, there had been 3 abortions in the 2d month, 2 in the 3d month, 1 premature delivery at 7 months, and 3 deliveries with face presentation at term. Moreover, in the 3 deliveries, 1 at 7 months and the others at term, the patient had serious heart symptoms in 2, while in the last pregnancy she had almost no symptoms at all. In the 2 former pregnancies she entered the hospital just before delivery and without any preliminary rest, while in the last

pregnancy she rested for a month in bed before delivery. The authors hold that a patient with a heart lesion, even if it is well compensated, should **rest in bed for a month** before delivery if she has had heart symptoms during a previous labor, in order to prevent a return of the symptoms.

According to E. Sachs (Deut. med. Woch., Jan. 13, 1928), the dangers of labor for the patient with heart disease are 3-fold: (a) Psychic excitement which causes blood-pressure fluctuations, (b) the extra burden on the heart in the 2d stage and (c) the creation of a vacuum in the heart after labor if, after the emptying of the uterus, the intra-abdominal blood-pressure falls and acute fluctuations occur. The diseased heart usually recovers speedily, however, if no infection be present. An instance of decompensated mitral stenosis and 1 of compensated aortic insufficiency are reported which illustrate these points.

**LARYNX.—TUMORS.**—Practitioners occasionally meet patients in whom persistent treatment fails to eliminate hoarseness, slight cough and, sometimes, aphonia, even though the patient appear generally in normal health. All such cases should be referred to the laryngologist, who will soon determine laryngoscopically the nature of the trouble. This is especially important today, since adequate treatment may arrest the development of a condition which may entail death.

**PAPILLOMAS.**—These tumors can readily be **removed** under local **cocaine-adrenalin anesthesia** with the laryngeal forceps. In children, however, the laryngeal cavity is usually too small and the patients too restless

to permit this procedure, and other measures are necessary. In 3 children aged, respectively, 2, 8 and 10, treated by Munyo (Arch. Latino-Amer. de ped., Nov., 1926), he successfully tried **X-rays**. In multiple papillomas hard to remove by the natural routes, a **laryngostomy** must be performed first. The irradiation is especially useful in preventing recurrences.

**CANCER.**—In laryngeal cancer the use of **radium** can only still be regarded as a palliative measure. An analysis of 30 cases treated by radium showed, according to Imperatori (Arch. of Otolaryng., Aug., 1926), that cure occurred only in exceptional cases. Only 1 of the 30 cases was cured. Of the living patients, 3 were also operated on by **tracheotomy-thyrotomy** and **laryngectomy**, 1 each. Clerf (*ibid.*, Oct., 1927) advises that **radium** be not used indiscriminately in this region owing to the dangers involved.

A palliative measure, amounting to a cure in some cases, consists of swabbing the laryngeal cancerous tissues with 1:1000 **adrenalin** solution daily. The neoplasm tends to recede after the 1st application.

**PARALYSES.**—In a case observed by Chiari and Stupka (Beitr. z. klin. Chir., cxxxviii, 461, 1926), an operation for goiter had caused paresis of the tissues supplied by the recurrent laryngeal nerve on both sides, phonation being possible, however, with the aid of the left recurrent nerve. By a **plastic operation** the authors created a permanent widening of the glottis, the patient being restored to health and working ability.

Colledge and Ballance (Brit. Med. Jour., Mar., 1926) advocate **anastomosis of the recurrent laryngeal**

**nerve to the phrenic nerve**, so as to restore movement of the paralyzed vocal cord in rhythm with the movement of the normal cord.

J. E. MacKenty (Arch. of Otolaryng., July, 1928), for the relief of *abductor paralysis* of the larynx, creates a small permanent **opening in the trachea** just above where it dips backward into the chest. After the 3d month the cannula previously used to keep the opening open is no longer necessary, thus removing all danger of asphyxia.

**Tuberculosis.**—E. A. Looper (Ann. of Otol., Rhin. and Laryng., Dec., 1926) deems erroneous the prevailing impression that laryngeal tuberculosis is a fatal complication of pulmonary tuberculosis for which little can be done in the way of treatment or cure. No condition responds more rapidly to properly directed treatment if a diagnosis is made reasonably early. Local treatment with the **electric cautery** has given excellent results, and the writer now uses it in preference to all other methods of treatment.

Sir S. Thomson (Lancet, June 5, 1926) likewise considers the **galvanocautery** as the most valuable remedy in laryngeal tuberculosis, but the cases in which it is suitable are relatively few. Well selected cases yield a cure in a large proportion. In all of 9 cases seen by Thomson and Trail (Lancet, May 7, 1927), tubercle bacilli were present, and the laryngeal lesions were definite and progressive; in 5 rapid healing followed the **collapse of 1 lung**; in the 6th case, local treatment and the **galvanocautery** secured cicatrization.

Of 872 tuberculous patients reported on by Parfitt (Amer. Rev. of Tub., May, 1927), 134 (15.4 per cent.)

had laryngeal tuberculosis and 85 (9.7 per cent.) non-tuberculous laryngitis. *B. tuberculosis* had been found in all but 1 of the patients with laryngeal tuberculosis. The writer advocates **sanatorium residence** for these patients, with **voice rest** and the use of the **galvanocautery**. Of the 134 cases, 45 have been classified as apparently arrested or higher; 13, apparently cured; 12, arrested; 20, apparently arrested; 7, quiescent; 21, improved, and 61, unimproved.

**Alcohol injections** into the internal laryngeal nerve in painful tuberculous laryngitis are recommended by Koerth, McCorkle and Hill (Tex. State Jour. of Med., Aug., 1928). In 13 cases of painful tuberculous laryngitis, 20 alcohol injections were made, this number including the reinjection of alcohol in 2 cases. Complete relief of pain on swallowing was obtained in 9 cases and partial relief in 2.

According to Gammons (Med. Jour. and Rec., Feb. 1, 1928), **mercurochrome-220 soluble** in 20 per cent. solution is a valuable agent in the treatment of pharyngeal and laryngeal infections complicating pulmonary tuberculosis. Three times a week he applies the dye on a swab, being sure of getting enough of the solution into the larynx. The color persists for a few days. No untoward reaction was ever observed.

Snapp (Jour. Mich. State Med. Soc., Dec., 1927) reports that **chaulmoogra oil** has proved very successful in his 25 cases. A 20 per cent. solution in olive oil was used in practically all instances. The oil is not a specific and should not replace the **electric cautery** or **heliotherapy**. Its greatest value lies in the relief of pain and dysphagia.

**LEPROSY.**—The treatment of this disease by **chaulmoogra oil** and its various preparations is continuing to receive the bulk of attention in leprosariums. F. A. Johanson (Pub. Health Reports, Dec. 9, 1927) tried an oil-soluble preparation which he terms **benzocaine chaulmoogra oil**, to render painless, if possible, intramuscular injections of the oil. He injected it in 24 lepers, using comparatively large doses twice weekly over a period of 6 months, with a negligible amount of pain, slight discomfort from pressure, and only a few oil abscesses (0.2 per cent.), such as are not infrequently encountered when an oil is injected intramuscularly. The preparation has the advantage of being readily absorbed, thereby giving the patient a uniform amount of chaulmoogra oil over a definite period of time. Of the 24 cases, 6 showed marked improvement; 12, moderate improvement; 5, slight improvement, while 1 was unchanged.

The following new derivatives of chaulmoogric acid have been prepared by Herrera-Batteke (Philip. Jour. of Sci., Jan., 1927): *Chaulmoogranilide*, *chaulmoogra para-bromanilide*, *ortho-chaulmoogratoluide*, *meta-chaulmoogratoluide* and *para-chaulmoogratoluide*.

According to Muir (Indian Jour. of Med. Res., Oct., 1927), intravenous injection of **sodium hydnocarpate** is the most effective means of administering hypnocardus preparations, but the blocking of the veins has hitherto interfered with prolonged administration in this way. The sodium salts derived from a special fraction of *Hydnocarpus wightiana*, and also the sodium salts of *H. anthelmintica* and *alpina*, block the veins less than the

salts from the whole *H. wightiana* oil. Mixing the salts prepared from the whole oil of *H. wightiana* with blood before injection has reduced vein blocking to a much more marked extent. Alternation of intravenous sodium hydnocarpate with subcutaneous infiltration of **hydnocarpus oil with creosote** is advised by the author, chiefly because of the hemolytic effect of the former preparation.

Lara (Jour. Philip. Isl. Med. Assoc., Feb., 1928), basing his conclusions on the results of treatment with the chaulmoogra derivatives in Culion Leper Colony, makes an urgent plea for a more general appreciation of the value of these drugs in the eradication of leprosy. As a result of the extensive use of the **iodized ethyl esters** and the refined oil, with the local treatment employed alone or in combination with the intramuscular injections during the last 6 years, 589 patients have been paroled or discharged as negative, as compared with only 47 discharged during the previous 15 years with less extensive and little systematized treatment. Including 39 other patients reacting negatively who have died in the colony, and 257 still under observation, a total of 885, or approximately 16 per cent., apparent cures have been obtained in a large group, mostly of advanced, bacteriologically positive cases, in which systematic treatment has been given for 6 months to 6 years.

**LEUKEMIA.**—In a summary of recent work on this disorder, J. B. Gordon (U. S. Naval Med. Bull., Jan., 1928) appropriately concentrates in the term "lymphoblastoma" the extensive terminology which has been

accorded to the progressive enlargement of lymphoid tissue. Concerning the age and sex, he refers to Minot's showing in an analysis of 477 cases of all types of lymphoblastoma (including lymphatic leukemia) that there are 2 peak points as to age susceptibility and that males are definitely more prone to the disease than females. The 1st peak shows the highest incidence of onset for males and for both sexes to be between the ages of 20 and 24. Of Minot's 477 cases, 327 were males and 150 females, a ratio of 2.12 to 1. The 2d peak shows a difference in sex distribution, the height being greatest in males between the ages of 35 to 39, and in females, from 40 to 44. The highest incidence in women is thus seen to develop later in life than in men. Considering Hodgkin's disease alone, the greatest incidence was found in the decade of 20 to 30 years of age.

Treatment is summarized by Gordon under: Irradiation, arsenic, benzol, surgery, and transfusion. Irradiation is given by both the **roentgen ray** and **radium**, generally using both in conjunction and subjecting the lymphoid tissues, especially the spleen, the mediastinal and cervical aggregations, and the long bones to multiple exposures at varying intervals, depending on the regression of the white count and the size of the structures being treated.

The arsenic preparations used are numerous, the most popular being **sodium cacodylate**, **potassium arsenite solution**, and **arsphenamine** or its newer modifications. **Benzol** therapy is waning in popularity. The white count can unquestionably be brought down by this drug, but the reduction is difficult to control and



continues after the drug has been stopped. Destruction of red cells is a concomitant feature, and a severe grade of anemia is often produced in patients who can ill afford to lose their resistance and fighting power.

Under **surgery**, such procedures as **splenectomy** and **excision** of hypertrophied masses of lymphoid tissue are grouped. While often affording temporary relief by the removal of pressure symptoms and improvement of cardiac and respiratory action, these measures are in no sense curative. **Transfusion** is used as a symptomatic remedy for the severe grade of anemia which always occurs, with resulting lowered resistance and cardiac embarrassment, and, of course, has no action in attacking the disease itself.

At this time, according to the writer, the main reliance is placed on **irradiation**, though its ultimate value is disputed. A. U. Desjardins, from an analysis of 49 cases of *Hodgkin's disease* and 97 cases of *lymphosarcoma* treated by radiotherapy, concludes that "it does not appear that radium and radiotherapy notably prolong life, though symptoms can be improved by reducing general glandular enlargement." In considering the results of radiation therapy in his 477 cases, Minot concludes that radiation is of doubtful value even in prolonging the course of the disease; 401 of this series are now dead; 238 of these were treated with X-ray or radium and 163 were not. Comparison of the length of life of irradiated and non-irradiated cases does not indicate that this treatment affects the duration of lymphoblastoma. The average duration of the disease in all cases in the series was 2.76 years. **Surgery** can probably

influence the course of the disease beneficially, especially if employed early and followed by irradiation.

**LUNGS.—ABSCCESS.—ETIOLOGY.**—A review by L. F. Morrison (Cal. and West. Med., Dec., 1927) of 241 cases of lung abscess showed that 4 had a definite history of onset of symptoms following sufficiently near to some operative procedure to suspect the operation or procedure as cause. In 20 cases, the operation had been a *tonsillectomy*. In 26 of the 40 cases, only the right lung showed involvement, while 9 showed involvement of only the left lung and 5 cases presented multiple abscess formation. Regardless of the treatment employed, there was no marked difference between the mortality rate in post-tonsillectomy lung abscesses and in those which followed some other type of operation. According to the latest follow-up reports, 10 patients with the former and 8 with the latter type of abscess are still living.

Of 103 cases observed by Kernan (Arch. of Surg., Jan., Pt. ii, 1928), 27 followed *tonsillectomy* and 12 were a sequel of *pneumonia*. In 20 cases the cause was not clear; 9 cases were caused by *foreign bodies*, and 8 by exposure to *cold*. In 68 of the 103 patients bronchoscopy was employed. Thirty-one were cured, but 2 later developed some other disease and died. Of the others, 15 were improved, 9 were not traced, 9 are dead, and 4 are under treatment. The patients that seemed to respond best to treatment were those following tonsillectomy.

**TREATMENT.**—The value of lipiodol (iodized oil) in the diagnosis and treatment of lung abscess has been studied by H. C. Ballou (Surg., Gyn.

and Obst., Jan., 1927). A review of 94 cases showed that a high percentage (25 per cent.) of such abscesses occurred following operations about the mouth and throat. Errors in diagnosis based on the so-called typical history and the relative infrequency of a demonstrable cavity with fluid level by the ordinary X-ray examination in chronic lung abscess are noted. The use of **iodized oil** by the bronchoscopic method, when combined with a definite routine examination, is regarded by the author of undoubted value. Its use caused no lung suppuration.

Out of 45 cases in which the operation of **cautery pneumonectomy** was carried out by E. A. Graham (Ann. of Surg., Aug., 1927), in 31 cases freedom from symptoms resulted. The same writer (Amer. Rev. of Tub., Jan., 1928) states that the mortality in any large series of chronic pulmonary suppurations is inevitably high, because approximately 10 per cent. of the cases are associated with carcinoma of the lung, primary or metastatic. Various auxiliary measures to operation are important, particularly **rest** in bed, **nearsphena-mine** in spirochetal cases, properly directed **heliotherapy**, **blood transfusion** and a **liver diet** for the anemia (the latter following the suggestion of Murphy and Minot for pernicious anemia), in addition to a **high caloric diet**.

O. Roth (Schweiz. med. Woch., July 3, 1926) obtained good results with Singer's method of **restriction of fluids** in several patients with **metapneumonic abscesses** of the lungs. The secretion diminishes remarkably when the fluids are restricted temporarily to 400 c.c. (13½ ounces)

daily. It should not be forgotten that fruits consist chiefly of water.

**CANCER.**—Discussing the apparent increase in new growth of the lung, Jackson, McCrae and Funk (Trans. Amer. Med. Assoc., May, 1927) emphasized the importance of recognition in the large proportion of cases originating in the bronchus. Early diagnosis, often possible by bronchoscopy long before any other method, frequently offers considerable hope for more efficient treatment, and possible prevention of extension.

Among 2014 general hospital patients observed in 2 years, Cremona and Lopez (Semana méd., Feb. 24, 1927) found 26 cases, i.e., 1.2 per cent., of malignant tumors of the lung and mediastinum. The growths included epitheliomas, sarcomas and endotheliomas originating in the pleura. Metastases were also common. The most frequent tumors were those derived from the bronchial and alveolar epithelium.

In an analysis of 76 cases, R. Probst (Zeit. f. Krebsf., Oct. 31, 1927) found that 62 were in males, 14 in females; 36 involved the right lung, 40 the left, while in 57 cases, the tumor was situated near the hilus. In 4 cases, only the main bronchus was involved. In 65, there was a direct relationship with a bronchus. In 2, the tissue of origin was the alveolar epithelium. There were 12 cancroids, 12 solid carcinomas, 6 adenocarcinomas, 4 cylindrical cell cancers, and 4 epitheliomas without cornification. The size of these tumors varied from that of an apple to that of a head. Often a whole lobe was involved and occasionally an entire lung. Metastases were present in 62 of the cases. In 12 cases lymph-nodes only were the seat of metastases. Of 65 clinical diagnoses, only 24 were verified. In 12

cases the localization of the trouble was correct, but the tumor was missed; 13 times a tumor was diagnosed, but its primary seat was missed. In 16 cases, neither tumor nor localization had been discerned. Hirsch and Ryerson (Arch. of Surg., Jan., Part I, 1928) observed 4 cases of primary carcinoma of the lung with metastases in 1 or more bones. The bone metastases caused the chief symptoms in all 4 cases.

**GANGRENE.**—A case of gangrene of the lungs with the isolation of *Bacillus subtilis* in cultures from the blood was observed by Bais (Jour. of Infect. Dis., Feb., 1927) in Sumatra.

According to H. Vincent (Bull. de l'Acad. de méd., Feb. 22, 1927), the pathogenic rôle of *Bacillus fusiformis* is more important than that of *Spirochaeta vincenti*. Out of 4 patients with gangrene or gangrenous abscess of the lung, he found spirochetes in 3. In 2 their amount was insignificant. The spindle-shaped bacillus was present in all. The coexistence of streptococci, tubercle bacilli or syphilitic spirochetes greatly favors the development of gangrene. Malnutrition, avitaminosis, anemia and diabetes are contributing factors, as is general anesthesia by ether or chloroform. The pathogenic micro-organisms came from the buccal cavity.

A case of pulmonary gangrene following acute diphtheria in a previously healthy colored girl, aged 15, was observed by Olcott and Merselis (Amer. Jour. Dis. of Childr., Feb., 1928). The symptoms were suggestive of gangrene for only 40 hours before death; practically no sputum was raised. At autopsy, the lower  $\frac{2}{3}$  of the right lung was found completely gangrenous. Mixed flora in the lung in-

cluded diphtheria bacilli, non-hemolyzing streptococci, staphylococci and Vincent's fusiform and spirillar organisms.

**TREATMENT.**—In a case treated by P. Jacob (Bull. Soc. méd. des hôp. de Paris, June 11, 1926), **unilateral artificial pneumothorax** brought about a cure in 8 months of a chronic pulmonary gangrenous process with a large cavity.

Novikov (Omskiy Med. Jur., ii, 98, 1927) used **neoarsphenamine** successfully in 2 cases of gangrene of the lung. At the time of the report the cures were of 3 and 2 months' duration, respectively.

Flaum (C. r. Soc. de biol., Dec. 17, 1926) used an **antigangrenous serum** in 8 cases, 20 to 80 c.c. being injected into the muscles daily. A total amount of 40 to 300 c.c. was given. A favorable action was observed in 6. Within 11 years, 41 cases of pulmonary gangrene were treated with the serum; 32 per cent. recovered or improved, while the remainder grew worse or died.

**LUPUS VULGARIS.**—The efficiency of **Finsen light** treatment in lupus is illustrated by cases treated by Haxthausen (Hospitalstid., Apr. 22, 1926); it results from the greater concentration of the therapeutic irradiation now possible through the improved technic of shutting off the heat rays. Fourteen patients out of 64 old inveterate cases were cured, and 31 much improved. The preceding X-ray treatment was responsible for failures in some of the others. All the more recent cases were cured, and in a shorter time than had hitherto been deemed possible.

According to Stempel (Derm. Zeit., Mar., 1927), lupus should be attacked

from all possible angles. General treatment by **light baths** is of great value. **Tuberculin**, given especially by the method of Ponndorf, is an adjuvant, and in a proportion of cases further help is got from **gold preparations**, of which **aurophos** has been found the safest and most efficacious. Local treatment must go hand in hand with general. It varies according to whether the lupus is ulcerated or closed. Small closed foci are suitable for **wide excision** and **suture**. Even larger lesions may be excised, allowed to granulate, and then **Thiersch-grafted**, but few cases are suitable for this, on account of the localization, and one then has to employ elective caustic applications, such as **pyrogallol** and **copper** preparations. Recently **sodium chloride**, **chloramine**

and **pyotropin** have been used. Preference is given to the **cold cautery** under local anesthesia, followed by pyrogallol ointment in decreasing strength. In smooth, non-ulcerated forms the **Kromayer** or **Finsen-Reyn** lamps may be used. Mucous membrane lesions may be coagulated with the **cold cautery** and afterwards painted with **pyotropin**, **lactic acid**, or **strong iodine** solution. Lesions near the eyes are also treated with the **cold cautery**, and later painted with Boeck's **pyrogallol-resorcin-gelanthum** paint.

Hypertrophic ulcerating forms, as seen especially on the nose and lips, are suitable for treatment by **X-rays** or **radium**, and the **quartz lamp** gives good results in the accompanying mucous membrane lesions.

## M

### MALARIA.—PROPHYLAXIS.

—According to P. E. McNabb and T. H. Stewart, Jr. (Amer. Jour. of Trop. Med., Nov., 1927), out of 225 United States engineer troops engaged for 4½ months in mapping unsanitated sections of the Isthmus of Panama, 106 (47 per cent.) contracted malarial infections while taking 15 grains (1 Gm.) of prophylactic quinine daily. Conversely, while taking the same amount of quinine and performing arduous field duty, only 14 men (6 per cent.) developed clinical symptoms of infection, and it was not until completion of the mission and discontinuance of quinine that most of the cases occurred. This suggests that active exertion and free perspiration promote the effects of the prophylactic.

C. C. Bass (N. O. Med. and Surg. Jour., Apr., 1927) holds that malaria is rapidly passing as an important disease of this country. At the present rate, within another decade or 2, it will be a negligible disease, except, perhaps, in certain very limited areas where special circumstances may result in its remaining for a longer time.

**TREATMENT.**—Various agents have been tried as adjuvants of or, if necessary, substitutes for quinine. Couto (Arch. f. Schiffs- u. Tropenhyg., July 1, 1926) considers **methylene blue** a good substitute for quinine; in mild cases it can be used instead of the latter, being especially useful in the cases refractory to quinine. In the *tropical* or *pernicious* type of malaria, he advises giving both remedies together **intravenously** from the



beginning, the dose of methylene blue being 0.05 Gm. ( $\frac{3}{4}$  grain) to 5 c.c. (80 minims) of water. From 2 to 5 doses can be given during the day. He has never witnessed any mishaps from the intravenous injection. In mild cases he gives the drug by the mouth in capsules containing 0.1 to 0.2 Gm. ( $1\frac{1}{2}$  to 3 grains), to a total of 1.5 Gm. (23 grains). It is taken during meals, to avoid irritating the gastric mucosa. The subcutaneous route is almost certain to cause an abscess and should be avoided.

Plata (Repert. de med. y cir., May, 1926) could observe no advantage in the use of **neoarsphenamine** over quinine in the treatment of malaria, while there is danger of serious by-effects. The cases in which it apparently proved superior were in reality cases of syphilis, relapsing fever, spirillosis, etc. The arsenicals should be reserved for exceptional cases.

In 2 patients in whom Bass (So. Med. Jour., May, 1926) tried full doses of **stovarsol** he found no evidence that it had any effect on the symptoms or parasites in quartan malaria. On the other hand, *benign tertian* symptoms and parasites disappeared while a patient was under treatment with stovarsol. In this case of tertian malaria and in others published it seemed to have an effect equal to, but by no means superior to, that of quinine in controlling both the active symptoms and the parasites.

U. Speranza (Riv. di malariologia, May-June, 1927) found that **bismuth** exerted in malaria an antiprotozoan action similar to its action in syphilis. Being inferior to quinine, however, it must be left for the uncommon cases of intolerance to the latter drug.

Dundas and Telang (Indian Med. Gaz., Mar., 1926) injected **mercuro-**

**chrome-220** soluble in 1 per cent. solution **intravenously** in 6 cases, the dose varying with the patient's weight and being approximately 0.003 Gm. ( $\frac{1}{20}$  grain) per kilo. ( $2\frac{1}{5}$  lbs.) of weight. It had no effect on the malarial parasites, even after 2 doses. Stomatitis and ptialism were marked features in every case. The drug appears to irritate the kidney sufficiently to produce mild nephritis. Their dosage, however, appears to be excessive.

G. R. Ross (Jour. of Trop. Med. and Hyg., Oct. 15, 1927), who used **mercurochrome** in small doses (2 to 5 c.c.—32 to 80 minims), was successful in 5 out of 6 cases of *malignant tertian* malaria in producing a period of clinical improvement and freedom from peripheral parasites. Two of the 5, however, relapsed within a short period, but the remaining 3 remained free from further manifestations of the disease during the period of observation.

**MALARIAL THERAPY.**—It would appear, from the experiments of W. D. Nicol (Jour. Ment. Sci., Apr., 1927), that the percentage of "cures" of **general paralysis** in patients inoculated by mosquito-bites is considerably higher than that in patients infected by direct blood inoculation. He employed a pure strain of the benign tertian malaria parasite cultivated in mosquitoes, and made available for inoculation by mosquito-bites instead of by the direct inoculation of blood from other patients at Horton Mental Hospital.

Referring to artificially induced malaria, A. R. Grant and J. D. Silverston (Jour. of Trop. Med. and Hyg., Apr. 15, 1926) draw attention to a strain of malaria which had reached the 47th year of its existence and still retained all its former potency and therapeutic value. In 1922, a patient with general paralysis was inoculated **with blood** from a patient who had contracted benign tertian malaria in India. From this host,

a long chain of cases of general paralysis and tabes were infected, with the result that during the preceding 42 months the strain had been transmitted by direct subcutaneous inoculation through 60 generations, comprising more than 150 cases.

G. D. Rudolf and J. C. Ramsay (*ibid.*, Jan. 1, 1927) found that the parasites varied considerably in numbers in the peripheral blood-stream during the course of malaria in patients with general paralysis. In 13 out of 14 cases, a decrease in the number occurred between the stages of sporulating and half-grown forms, and in 10 out of the 14 an increase in number took place as the parasites grew from young rings to older intracorporeal forms. The decrease in numbers as the parasites pass from  $\frac{3}{4}$  grown forms and as they sporulate and become small rings corresponds with the general biologic law that when the mortality is high, large numbers of eggs or young organisms are produced. In 5 out of 10 patients, a relationship was found between the numbers of parasites and the degree of fever. In these 5 cases, the same number of parasites was not accompanied by the same degree of fever in different patients, but as the temperature became greater the parasites increased, and decreased as the rises of temperature became smaller.

In 50 examinations of blood in 14 cases of general paralysis under treatment with tertian malaria at Wagner-Jauregg's clinic, Cuboni (Wien. klin. Woch., Dec. 16, 1926) confirmed the complete absence of gametes.

Mörch (Deut. med. Woch., Apr. 30, 1926) holds that the positive Wassermann reaction provoked in general paralysis patients by the malaria treatment is non-specific. The flocculation (sigma) reaction only exceptionally is rendered positive by it.

**Diseases other than General Paralysis.**—Observations by Stumpfl (Wien. klin. Woch., Nov. 17, 1927) in over 1000 patients treated by therapeutic malaria showed that the tertian fever curve was high in early cases of syphilis. Only 7 per cent. of the paralytics presented a pure tertian fever. Cases of tabes, multiple sclerosis and postencephalitic Parkinsonism occupied a middle ground.

In various diseases of the nervous system, D. Paulian (Marseilles-méd., Feb. 15, 1928) 1st used subcutaneous inoculations of blood

from malarial patients, but the results were so delayed that he soon adopted the intravenous route. With this method the shock fever appears on the same day the inoculation is made, lasts but a few hours, and is followed by a period of apyrexia lasting about 5 days. The malarial fever then makes its appearance and continues until stopped with quinine. The effect of fever thus produced on 193 cases of syphilis of the nervous system, together with its effect on some cases of non-syphilitic nervous diseases was studied. The following results were noted: (1) In **multiple sclerosis**, results practically negative, or a very slight amelioration; (2) in **Parkinsonism** and in the sequelæ of epidemic encephalitis, an early slight amelioration or none at all; (3) in **Parkinson's disease**, no improvement; (4) in manic-depressive states, the malaria therapy only accelerated the progress of the disease and caused an earlier appearance of the remission; (5) in **dementia precox**, remission of short duration, condition stationary; (6) in **syphilitic paraplegias**, marked improvement; (7) in **paranoic conditions**, no improvement.

**MALTA FEVER.**—As urged by W. W. Watkins (Trans. Amer. Med. Assoc., May, 1927), Malta fever is endemic in several western states, chiefly among persons in contact with goats. In some cases, in which this contact could not be proved, infection was probably with the abortus type of the organism. The Phoenix epidemic of 1922 was almost entirely traceable to raw goat's milk sold in the city. The author refers to 2 deaths in patients who were already debilitated by other illnesses.

The blood of cases of Malta fever observed by Hardy, Linton and DeCapito (Jour. Iowa State Med. Soc., Nov., 1927) was found to agglutinate *Brucella melitensis*. In 12 cases, confirmatory tests were done, and the titer in both examinations was 1:160 or higher. These were evidently proved cases of Malta fever. The

blood of 3 others gave an agglutination titer sufficiently high to be diagnostic, but only 1 examination was done. These should be accepted as probable cases of Malta fever. The remaining 4 gave agglutination in a titer of less than 1:80. Only 2 of these were confirmed by a repeated examination.

**TREATMENT.**—G. Izar (Rass. intern. di clin. e terap., Nov., 1927) found that intravenous injection of **acriflavine** (0.01 Gm.— $\frac{1}{6}$  grain—per kilo.— $2\frac{1}{2}$  lbs.—of body weight) acted favorably on the course of Malta fever, 2 or 3 injections being usually required. The effect on the fever was almost immediate. The spleen and liver enlargement, however, persisted longer. In addition to the bactericidal power of the drug, there may be some vaccinating action by the killed germs, as shown by the increased agglutinating power in the blood of treated patients. In 1 case good results followed the use of small (0.2 to 0.3 Gm.—3 to 5 grains) enemas.

Giuffrè (Pediatria, Apr. 1, 1927) adds clinical testimony to the value of intravenous injections of the **specific vaccine** which is dissolved, he states, by the action of the antiserum.

**MAMMARY GLAND.—MASTITIS AND MAMMARY ABSCESS.**—*Typhoid abscess* may occur long after the occurrence of typhoid fever. In a case of mastitis observed by W. Gerlach (Münch. med. Woch., Aug. 5, 1927) in a woman of 37 years, typhoid fever had occurred 8 years previously. During convalescence a painful lump appeared in the right breast, which responded to treatment with **cold compresses**. On dismissal, the lump in

the breast had shrunk to the size of a walnut, which condition persisted unchanged until 8 months previously. **Incision** of the abscess evacuated a large quantity of thin, greenish pus, which contained a pure culture of typhoid bacilli.

Snoke and Goforth (Amer. Jour. Med. Sci., Apr., 1926) report a case of proved typhoid abscess of the breast occurring 1 year after lactation. It was preceded by 3 post-lactation masses, perhaps periductal adenofibromas, which may have afforded foci for the localization of the typhoid bacilli.

**TREATMENT.**—To continue lactation in mastitis, according to Oettingen (Zent. f. Gyn., Oct. 1, 1927), is contrary to the generally accepted principles that the inflamed part should be kept at rest. In 1923 the Women's Clinic of Heidelberg University decided to take the child from the breast on the appearance of mastitis and to use **Bier's cupping**. The results improved (20 per cent. of abscesses in 2 years as against 30 to 44 per cent. in the previous 6 years). In 1925, however, the cupping was discontinued and the percentage of abscesses dropped to 11 per cent.

E. Cary and A. K. Van Dusen (Ill. Med. Jour., Oct., 1927) advocate injection into the buttocks of **manganese butyrate** to control breast infections. It was used in a series of 8 cases of beginning breast abscess, all of which terminated in spontaneous resolution.

Using 20 per cent. of the erythema dose and with a focal distance of 30 to 40 cm., E. Zweifel (Strahlenther., xxiv, 318, 1926) used **X-rays** over fields slightly exceeding in extent the margins of the inflammation. Equal

results were obtained whether copper or zinc filters 0.5 to 1 mm. in thickness or aluminum filters 3 mm. thick were used. Only 1 irradiation was given. In mastitis the results were favorable when the irradiation took place as early as possible after the onset. When abscesses had already developed, the irradiation was useless. In the successful cases, pain was relieved and the patients were again able to obtain sleep; the temperature fell from 2 to 3° C. in 24 hours.

Velasco Blanco and Paperini (Arch. Amer. de med., Oct. 1, 1927), of the Buenos Aires Maternity, used for 8 months, the **De Buys** (New Orleans) **breast bandages**. No case of suppurative mastitis developed.

**CANCER.**—The etiology and pathology of Cancer have been reviewed under the general heading of this disease (see **CANCER**). This article will, therefore, be limited to the treatment of mammary gland neoplasms.

**TREATMENT.**—The efficiency of therapeutic measures, including surgery, can be established on sound lines only by knowledge of the course of events in untreated cancers. E. M. Daland (Surg., Gyn. and Obst., Feb., 1927) studied the latter in 100 cases untreated by operation, roentgen ray or radium, the duration being computed from the time of the 1st symptom noticed by the patient. The average duration was 40.5 months; the mean duration, 30 months. The longest duration was found between the ages of 60 and 64, the shortest between 55 and 59, except for 1 patient who was 33 years of age. Comparing the length of life in untreated cases with that in 2 operative series, Daland found that in the untreated

series, 40 per cent. were alive at the end of 3 years, 22 per cent. after 5 years, 9 per cent. after 7 years, and 5 per cent. at the end of 10 years. The last patients died 13 years after their 1st symptom. Lung or pleural metastasis was observed in 18 cases; liver involvement in 11. The 22 per cent. of the patients who had swollen arms did not live quite as long as the average of the series; 15 per cent. had bone metastases. They lived slightly longer than the average. A study of the degree of malignancy, as made by microscopic study, failed to show any relationship between the length of life and the degree of malignancy.

**Radium**, in the opinion of Fitzwilliams (Practitioner, Nov., 1928), has long reigned supreme, and he expresses the opinion, judging from results, that the time will soon come when the modern surgical operation will not be necessary when an adequate supply of radium is within reach. He warns, however, that considerable experience is needed in the use of radium, and that in unskillful hands it may be more dangerous than is the knife in a careless surgeon's hands.

As emphasized by Pfahler and Widmann (Amer. Jour. of Roentgenol., Dec., 1925), quoting Ewing, in mammary cancer surgery has to contend "with more peculiar difficulties and uncertainties than with almost any form of the disease." The same authors, referring to the use of **X-rays** in 701 cases (Radiol., June, 1926), also conclude that with due consideration given to the degree of malignancy and the extent of the disease, the present technic with high voltage and highly filtered rays is giving better results than have ever



been obtained before. But they add, "we have at hand now, however, so much power for good and evil that the keenest clinical judgment and the most expert technic are necessary."

**Surgical diathermy** is advocated by J. Anderson (Brit. Jour. of Surg., Jan., 1928). Of 56 cases of carcinoma of the breast excised by the arc electrode (1923-1926) he reports 43 patients as being alive and apparently well. Thirty of these had glandular metastases at the time of operation. There has been no case of simple local recurrence, but 2 patients, in whom the disease was found at operation to be beyond the range of excision, ultimately died of diffuse general metastasis with local and general nodules. There has been only 1 case of appreciable edema of the arm, and in this case malignant glands were found adherent to the axillary vessels and nerves. The edema had receded at the time of writing and the patient appeared well. There was no case of secondary hemorrhage or of protein shock.

In 2 cases of malignant tumor of the mammary gland, Debedat and Bardon (Jour. de méd. de Bordeaux, Feb. 10, 1928) used a **diathermy knife** shaped like a sickle. In the 2d case, in which **adhesive plaster** bands were used, cicatrization was complete in 30 days, as compared with 42 days in the 1st case, in which **silk-worm-gut sutures** were used.

**Radium-surgery**, meaning thereby the direct combination of surgical measures with radium treatment, is extolled by J. Hirsch (Deut. med. Woch., Aug. 19, 1927), who reports 22 cases; 3 of these were carcinoma medullare, 5 scirrhus and 14 carcinoma simplex. Of 22 patients, observed on an average for 3 years, 21

were cured; 4 were free of recurrence for 3 to 5 years; 17 for 5 years, 6 for 6 years. Seven cases were observed for 7 years; 3 of these for 10 years. Scar recurrences in these 3 were treated and after 5 years there is absolute cure. Among the cured are 2 with bilateral gland cancer.

Favoring **post-operative irradiation**, Borak (Wien. klin. Woch., May 20, 1926) states that 10 years ago he treated with X-rays 62 women after operation for carcinoma of the breast. Of these, 26 (42 per cent.) have died from other diseases. Schoute and Orbaan (Acta radiol., July 30, 1927) review 112 cases of mammary carcinoma treated operatively, showing improved results since the introduction in 1920 of X-ray treatment as soon as possible after amputation.

According to W. Anschütz (Beitr. z. klin. Chir., cxxxix, 25, 1927), who refers to the statistics of the Kiel University clinic, small, frequently repeated doses— $\frac{2}{3}$  of the erythema dose, 3 fields, 10 to 11 irradiations distributed over 2 years—have proved more efficacious than Wintz's intensive method.

**MASTOIDITIS.**—A. M. Alden (Arch. of Otolaryng., Jan., 1927) warns that if the pediatrician does not appreciate the intimate connections that often exist in the *infant* between obscure ear infection and gastro-intestinal disease, he will fail to call the otologist into consultation and the condition will go unrecognized. Proper recognition of the significance of this combination and closer study by otologists of infections in the infantile ear will in a few years result in the reduction of infant mortality.

Of 39 infants with mastoiditis recorded by B. J. McMahon (*ibid.*, Jan., 1928), 22 showed the symptom-complex of increased temperature, diarrhea, vomiting, loss of weight and athrepsia. Six of these died. The prognosis is bad if, when edema of the mucosa of the mastoid antrums is found microscopically, the "diarrhea-vomiting symptom-complex" is present. The prognosis is good when fibrosis of the mucosa of the mastoid antrums is found microscopically, even though the diarrhea-vomiting complex is present. When the complex is not present, the prognosis is equally good whether the mucosa of the mastoid antrums shows edema or fibrosis microscopically.

**MEASLES.**—The high mortality of this disease, to which attention was called in the preceding SUPPLEMENT, is shown by E. S. Godfrey, Jr. (Jour. of Prevent. Med., Jan., 1928) to be especially great in institutions for children and for mental defectives. These represent from 3 to 26 per cent. of the annual mortality from this cause in New York State, exclusive of New York City. The average for the 8 years from 1915 to 1922 was 10 per cent. Outside of such institutions—those caring for children under 2 years of age and those for mental defectives—a large percentage of the small children were foundlings and illegitimate children, many of them marasmic, rachitic or otherwise undernourished. The mortality rate from causes other than measles was excessively high. The institutions were frequently overcrowded. In some instances the personnel was insufficient to carry out the routine properly, and was decidedly inadequate, both

in numbers and in training, to cope with an epidemic of measles.

**ETIOLOGY.**—Cary and Day (Trans. Amer. Med. Assoc., May, 1927) studied this phase of the subject in 85 cases, the secretions from the pharynx, nasopharynx and conjunctiva and blood being used for cultures. Cultures were made during all stages of measles on blood sugar, Hiss serum brain, Hibler's and other mediums under aerobic and anaerobic conditions. Throat and nasopharyngeal cultures on blood agar were found to yield *green-producing diplococci* in 98 per cent. of all cases. Blood cultures and conjunctival cultures disclosed a similar organism in many early cases. A febrile response and mild rashes could be produced in rabbits inconstantly with the organisms and filtrate from broth cultures. Transfer from 1 rabbit to another was also possible.

The specificity of the green-producing diplococcus in measles was shown in additional studies by R. Tunnicliff (Jour. of Infect. Dis., Oct., 1927). She observed that the green-producing diplococci isolated before the appearance of the rash in measles and during the acute stage are immunologically distinct from nearly all similar cocci isolated during convalescence. Measles cocci grown in normal and immune horse serum dextrose broth lose their specificity, as determined by the opsonic method. Their specificity may be restored by transfusing them on blood agar at 36° C. for a few generations. Growing measles cocci at room temperature does not affect their specificity, but growth at 40 to 41° C. completely removed their specificity, as determined by the opsonic method.

**PROPHYLAXIS.**—A study of the blood values from convalescents conducted by J. H. Townsend (Boston Med. and Surg. Jour., May 13, 1926) revealed some interesting facts. The study was conducted in the course of an epidemic of 63 cases in a boarding-school of 400 boys. In a dosage of 20 c.c., blood from an adult who had measles 20 years previously seemed to have no effect either in preventing or in modifying the disease. **Blood from convalescents**, however, in a dosage of 9 c.c. of whole blood (5 to 5.5 c.c. of serum), while it had little or no effect in preventing infection, influenced markedly the course of the disease when it was given before the end of the 1st week of the incubation period. In 32 patients in whom convalescent blood was injected at least 8 days before the development of the rash there was an average duration of the febrile period of 3.66 days, whereas 21 boys who received no inoculation showed an average duration of the febrile period of 6.45 days. The average maximum temperature of the 32 boys referred to was 102.5° F., whereas the average maximum temperature of the 21 who received no inoculation was 103.5° F. The average stay in the infirmary of the 32 inoculated boys was 9.7 days, that of the control group 13 days. No complications occurred in the inoculated group, whereas in the control group there was 1 case of bronchopneumonia, 1 of otitis media, 1 of frontal sinusitis, and 1 of external otitis. The mild character of the disease in many of the boys who received inoculations was very striking. The inoculations had no ill-effects whatever. Beneficial effects were obtained whether the blood was administered as late as 6

days after exposure or as early as 12 days before the probable date of infection.

**Tunncliffe's immune goat serum** appeared to Hoyne (Ill. Med. Jour., Feb., 1928) to be a reliable measles prophylactic if given within 3 days of exposure. If given later, it is likely to modify an attack of measles, should the latter develop. Although serum rashes developed in 13 per cent. of some of the immunized groups, no serious reactions were observed. There appears to be no contraindication to the use of the goat serum. It should be given intramuscularly in 5-c.c. doses, as a rule. If more than 3 days have elapsed since exposure, the dose should be doubled.

**MENINGITIS. — MENINGOCOCCIC.—SYMPTOMS.**—In a study of the clinical phenomena of *endemic meningococcus meningitis* in infancy and early childhood, based upon 136 patients aged from 23 days to 7 years, and 50 per cent. of which were admitted to the hospital over 1 week after the onset of the disease, S. McLean and J. P. Caffey (Amer. Jour. Dis. of Childr., Mar., 1928) found that in the majority of cases the disease had not been recognized prior to examination in the hospital. Of 42 cases, 12 patients under medical supervision had been observed for more than 3 days without diagnosis. Muscular rigidity, especially at the level of the neck, with or without retraction of the head, was present in 84.5 per cent. The tendon reflexes were increased in 59 per cent.; Kernig's sign was present in 41 per cent., Brudzinski's sign in 36 per cent. Both signs were unreliable when present in infants. Unexplained irritability was

present in 62.5 per cent. In 63, or 46.2 per cent., drowsiness, stupor or coma was noted before lumbar puncture. Bulging fontanel was noted in 56.6 per cent. of the patients with an open fontanel. Convulsions were present in 29.4 per cent. of all cases; nearly all occurred at the onset of the disease. Eleven per cent. of the patients had a hemorrhagic eruption. Herpes occurred in but 2 patients, both over 1 year of age. The temperature curve did not prove to be a reliable indication of the presence of the disease. Vomiting occurred in 56.6 per cent. Diarrhea, frequently mentioned as a common symptom of meningococcus meningitis in infancy, occurred in but 2 per cent. The *tache cérébrale* was noted in 30.8 per cent. Strabismus, present in 20.5 per cent. was the most frequent ocular manifestation observed.

**TREATMENT.**—The importance of early diagnosis and prompt use of **antimeningococcic serum** is confirmed by A. Wadsworth and M. B. Kirkbride (Amer. Jour. of Hyg., July, 1926), yet striking results were recorded in some of the patients treated late in the course of the disease.

In meningococcic meningitis G. K. Thornton (Lancet, Sept. 10, 1927) obtained excellent results from the use of **Flexner's serum**. The mortality was only 26.6 per cent., as against 80 per cent. in cases treated by **lumbar puncture** and 78.5 per cent. in cases treated with serum other than Flexner's.

In 2 of the 3 cases described by A. A. Ugón (Arch. Latino-Amer. de ped., Jan., 1926), the symptoms indicated epidemic meningitis but no meningococci could be detected. The children, aged 3 and 5, recovered under **serotherapy**. In the 3rd case, the clinical

picture was that of tuberculous meningitis, but the child recovered in 6 weeks, and inoculation of animals was negative. The bacteriologic findings in all 3 had been constantly negative.

Wide fluctuations in the tension were recorded in the course of epidemic meningitis in a young woman observed by Renzo and Assis (Rev. med. cir. do Brazil, Feb., 1926). She died on the 25th day; serum therapy had not been begun until the 3d day. The irregularity in the course, the recrudescences, hypertension, and weakness after the injections of the serum indicated a toxic action on the part of the non-specific constituents of the **serum**, detracting from its therapeutic effect. They urge the starting of the serum treatment within 48 hours, even on mere suspicion of the disease from nuchal rigidity. In 37 other fatal cases, the course had been from 2 to 30 days. The prognosis is unfavorable if more than 48 hours have elapsed since the 1st symptoms before the serum is injected.

In a very severe case of epidemic cerebrospinal meningitis Alexandre drew blood from the patient's father and mixed it with the antiserum. A prompt turn for the better followed intraspinal injection of this **reactivated specific serum**. Esquerdo (Rev. med. de Barcelona, Feb., 1926) applied this same method in 2 grave cases of *pneumococcus meningitis*. Both children improved at once, and recovery was soon complete, without sequelæ.

F. Hamburger (Wien. klin. Woch., Apr. 29, 1926) withdraws all the cerebrospinal fluid gradually, substituting air for it at the same time (about 50 to 100 c.c. in children). He then elevates the patient's pelvis and injects serum gradually, withdrawing



the air at the same time in portions of 10 to 20 c.c. He reports recovery in 3 out of 4 cases.

**SYPHILITIC.**—Among 9 cases observed by H. D. Lloyd (Boston Med. and Surg. Jour., Sept. 29, 1927), headache occurred in 8, stiff neck in 6, vomiting in 2, and fever in 7. Only 2 showed a Kernig sign, and in 7 the knee-jerk was normal. In 7, these manifestations occurred in the 1st year of the disease; in 1, 16 years after infection. One case was of the congenital type. The writer feels that **lumbar puncture** and the administration of **Swift-Ellis serum** by the lumbar route, or in more severe cases either by **cistern puncture** or **intraventricular puncture**, offers the best prognosis. Of the 9 patients, only 1 died. Ames and W. W. Barber (Amer. Jour. of Syph., Oct., 1927) describe 4 cases showing that meningitis of syphilitic origin may occur in strong, well-nourished *babies* in whom no stigmata of syphilis can be found. The prognosis is universally bad, according to the authors.

**TUBERCULOUS.**—An instance of *acute* tuberculous meningitis with recovery has been reported by Vidal, Giraud and Puech (Bull. Soc. des sci. méd., Apr., 1926). The patient, a young woman, developed an acute, severe, febrile meningeal syndrome. The cerebrospinal fluid was clear but contained cells, mostly lymphocytes, and an acid-fast bacillus which induced typical tuberculous lesions in an inoculated guinea-pig. Two of the patient's brothers and 2 cousins had died from tuberculous meningitis. On the 5th day the whole meningitic picture disappeared, and recovery was complete, with no signs of recurrence during the 32 months to date, al-

though the young woman had acquired syphilis in the interim. They explain the case as an ephemeral tuberculous meningitis, in which the defensive functions conquered the invading bacillus.

In the 60 cases of alleged recovery from tuberculous meningitis on record, in 14 inoculations on guinea-pigs was positive but no tubercle bacilli could be detected with the microscope; in 7 both methods of examination were positive, as likewise in the case described. Fully 25 per cent. of the patients are known to have succumbed to tuberculosis later, and the true figure of such deaths is probably much higher as it has been impossible to trace them all.

The etiology of primary tuberculous meningitis in children was studied by Debré and Crémieu-Alcan (Revue franç. de péd., Nov., 1926) in 70 children, aged from 2 to 15 years. In 64 per cent. of the cases contagion occurred outside the family, while the origin of the chronic forms of tuberculosis is chiefly in the family. This tends to confirm the opinion that children living in a tuberculous environment possess, if not an hereditary, at least an acquired immunity. Repeated contaminations evidently attenuate to some degree the severity of superinfections. On the other hand, children of healthy families, free from tubercle bacilli, are unable to resist a massive accidental contamination and contract acute tuberculosis. The latent period was not more than 1½ years, while in tuberculosis of bones and joints, it is from 2 to 5 years, and still longer in chronic pulmonary tuberculosis.

Neidhardt (Münch. med. Woch., May 14, 1926) carried out 10 lumbar punctures within 3 weeks in a boy

with tuberculous meningitis. He injected 3 times, at 5-day intervals, 0.5 mgm. of **old tuberculin** in 20 c.c. of physiologic salt solution intraspinally. The patient recovered.

**MENOPAUSE.**—As recalled by W. F. Shaw (Brit. Med. Jour., June 19, 1926), *excessive or irregular hemorrhage* about the time of the menopause and after it are commonly observed. Carcinoma of the cervix is a very common disease about the menopause, though it may occur at almost any age. Erosion of the cervix consists of a slightly raised velvety red area extending onto the vaginal surface of the cervix from the external os. Hemorrhage is readily produced by the examining finger, which makes this condition likely to be mistaken for carcinoma of the cervix. As a uterus approaches the menopause, the blood-supply diminishes and the muscle atrophies. Normally these changes run concurrently, so that the diminishing muscular tissue is able to exercise the same control over the diminishing blood-supply as it did in full vigorous life. If, however, the atrophy of the muscle outstrips the diminution of the blood-supply the same control cannot be exercised and menorrhagia occurs. The only treatment is the administration of **puitrin**, **ergot**, or **hydrastis**—drugs which stimulate the weakening muscle to greater effort. These drugs must never be given without a vaginal examination, to eliminate any possibility of carcinoma.

As stated by J. H. Hannan (Brit. Med. Jour., July 2, 1927), the tonus of the *sympathetic nervous system* at the menopause is increased. This is responsible for the vasomotor phenomena and, possibly, for some of the

other symptoms which make up the menopausal syndrome. The augmented tonus is attributed by the writer to the unrestrained action of the suprarenal glands, the internal secretion of the ovaries being deficient or absent. Thyroid gland should be avoided, owing to its sensitizing action on the adrenals. Nor should chloroform be used as an anesthetic during the menopause.

Montlaur (Paris méd., Jan. 21, 1928) states that the skin diseases most common at the menopause are acne rosacea, pruritus, eczematiform reactions and alopecia. **Organotherapy, sedative treatment, desensitization** and various external treatments are recommended.

**MENORRHAGIA AND METRORRHAGIA.**—**MENORRHAGIA.**—Endocrin factors are rapidly gaining ground in the pathogenesis and treatment of this disorder. In cases of irregular and abnormally profuse bleeding in *young girls* Lissner (Endocrinol., Jan.-Feb., 1925) recalls his previous observations concerning the benefits of **thyroid**. In the absence of local causes within the pelvis, an early onset of menstruation (9 to 12 years of age), together with long continued and copious bleeding, is very suggestive of hypothyroidism. Early maturity, with early development of secondary sex characters, is the dominant characteristic of this syndrome. There may be little else in the clinical picture to indicate deficiency of thyroid secretion. The basal metabolism being found low, the author administers desiccated **thyroid**, 1 grain (0.065 Gm.) daily at first, gradually increasing the dose to 4 grains (0.26 Gm.) daily.

E. Allen, Compere and W. L. Austin (Amer. Jour. of Obst. and Gyn., Feb., 1927) found that the calcium content of the blood following **parathyroid extract**, as they have used it, does not show the rise reported by Kylin, but that the bleeding time and clotting time of the blood are definitely shortened. The number of days of menstrual bleeding, as well as the amount of blood lost, was appreciably reduced. During the intermenstrual period, the patients were not so reduced in strength and vitality. They recommend a total dosage of 120 to 160 units, given in divided doses of 20 units, morning and evening. The best results were obtained by starting the intramuscular injection the day before the period was due.

Bakscht (Zent. f. Gyn., May 22, 1926) draws from the ulnar vein of the patient 14 c.c. of **blood** into a syringe containing 6 c.c. of sterile distilled water. The blood is **hemolyzed** by rapid shaking, and is **injected intragluteally**. Uterine hemorrhages of endocrin origin yielded to this treatment in from 18 to 24 hours. Stubborn cases required several injections to obtain results, and in all cases, regardless of the promptitude of the response, at least 4 or 5 injections were given at intervals of 2 days. Neither local nor general untoward reactions took place.

E. Vogt (*ibid.*, Mar. 19, 1927) obtained good results with **insulin**, 40 to 50 units a day. The midday and evening meals, before which the injections are made, must contain at least 30 Gm. (1 ounce) of carbohydrates each, and measures to combat hypoglycemia must be ready at hand. The treatment was usually started in

the 2d half of the menstrual period and was continued for 3 or 4 days, or until the bleeding showed signs of stopping. Cotte (Presse méd., Feb. 11, 1928) begins on the 4th day of the menstrual period with 40 or 50 units of **insulin**, divided into 2 doses, and given before meals. Administered for 3 or 4 days in succession, this treatment was successful in the 4 cases reported. He thinks it probable that insulin acts by regulating ovarian function.

In the uterine hemorrhages of young girls, **blood transfusion** is advocated by Michon and Banssillon (Gyn. et obst., Apr., 1927). They usually follow **curettage** by **cauterization** with a 50 per cent. solution of **zinc chloride**. **Uterine fixation** may be added. The **X-ray** and **radium** therapy are valuable. Results from the use of sodium citrate intravenously were inconclusive. **Transfusion of citrated blood** gave excellent results. The authors used for this purpose a glass syringe or the Jubé apparatus, injecting 50 to 100 c.c.

H. Schmitz (Amer. Jour. of Obst. and Gyn., Mar., 1928) urges that curettage be performed and the scrapings examined microscopically if the cause of the bleeding cannot be determined. Otherwise hidden malignant disease may be overlooked.

B. Mann (Med. Jour. and Rec., May 16, 1928), referring to hemorrhage from the non-pregnant uterus, offers the following conclusions in an analysis of the question: 1. Hemorrhage is the most important diagnostic symptom of cancer of both cervix and fundus. 2. Hemorrhages from cancer are intermenstrual, prone to follow trauma, progressive and painless. 3. Cancer of neither the cervix nor the fundus influences menstruation. Irritation or ovarian involvement may produce menorrhagia, and accidental hemor-

rhage just before or after a period may produce an apparent prolongation. 4. Cancer of the cervix and fundus are both often advanced before medical aid is sought. 5. All suspicious cases should be viewed as malignant until proved otherwise. 6. Biopsy or curettage is the most reliable diagnostic method in the early cases, according to the site of the suspicious lesions. 7. Lacerations of the cervix, especially those associated with erosion and cervicitis, should be repaired prior to the cancer age. 8. Women, particularly multiparæ, should be examined periodically during the cancer age, especially during the menopause.

A review of the literature and their own cases, 6 of which are reported, led Tzovaru and Mavrodin (Presse méd., Aug. 10, 1927) to conclude that whether genital hemorrhage be due to an alteration of the blood composition or to an altogether local cause, concentrated solutions (30 per cent.) of **sodium citrate**, given intravenously, are the most efficacious means of treating them.

Sippel (Zent. f. Gyn., Jan. 9, 1926) treated successfully 20 girls suffering from profuse menorrhagias and metrorrhagias by **transplantation of pieces of human ovaries**. Ovarian cysts, which were found in some of the patients, were enucleated. In some of them the uterine mucosa during hemorrhages was evidently not functioning. After the transplantation and return of normal menstruation, the uterine mucosa resumed the typical aspect and contained glycogen.

**METRRORRHAGIA.**—G. Klemperer (Monats. f. Geb. u. Gyn., Nov., 1926) observed 3 cases of severe metrorrhagia associated with *subcutaneous hemorrhages*, in which the blood showed thrombopenia. **Splenectomy**

cured the 1st case, a girl of 20 years. In the 2d case, a woman aged 23, the same treatment was temporarily successful, but in a year's time the thrombocytes, which immediately after the operation had risen from 24,000 to 141,000, fell to 13,000. A year and a half after the splenectomy the severe uterine and subcutaneous bleedings reappeared. Two courses of **roentgen irradiations** of bones, 9 months apart, brought about clinical cure, with a gradual increase of thrombocytes to 26,000 and a normal bleeding time. The patient has felt well and been able to work for a year. In the 3d patient, aged 13 years, X-ray irradiation of the long and flat bones, without splenectomy, was successful. The patient has been under observation 5 months.

Barthélemy (Bull. Soc. d'obst. et gyn., xiv, 425, 1925) observed a case in which *exophthalmic goiter* was also present. The goiter had started when the patient was 19 years old and had increased during each pregnancy. The right lobe of the thyroid was especially large and presented partial cystic degeneration. The degenerated portion of the gland was extirpated under local anesthesia, and was found to consist of 3 cystic nodules, each as large as a small nut and containing a brownish colloid substance. The patient had an uneventful recovery and returned home without any treatment having been directed to the menstrual excess. Six months after the operation, there had been no further uterine hemorrhage, and the menstrual periods were regular and normal.

Wetterwald (Schweiz. med. Woch., Jan. 14, 1928) observed 3 cases of post-climacteric uterine bleeding for which there was no cause other than *ovarian tumor*.

**MERCURY.**—A research by R. B. Wild and I. Roberts (Brit. Med. Jour., June 26, 1926) to determine the *absorption*



of mercury by the skin, showed that all mercurials, when rubbed into the skin, were absorbed to some extent from all the bases tested. In all cases the greatest absorption took place from the lard basis. Of the different mercurials examined, mercuric oxide was the most readily absorbed, either as an ointment or in the form of the official oleate. This, however, is not suitable for use when the general absorption of mercury is desired, as ointments containing more than 10 per cent. of the oxide cause considerable irritation of the skin. Ammoniated mercury and mercuric salicylate were absorbed almost as well as the oxide. Calomel was absorbed to a less extent than any of the other mercurials examined. Metallic mercury was absorbed rather less than the oxide, but can be used in stronger concentration without causing undue irritation. The official mercurial ointment with a lard base seems to be the best preparation for insuring the general absorption of mercury.

In keeping with the observations of other clinicians, Zinsser (Münch. med. Woch., June 10, 1927) extols the advantages of an ointment containing 10 per cent. of yellow oxide of mercury in the treatment of furuncles and phlegmons.

**POISONING.**—According to Trusler, W. S. Fisher and C. L. Richardson (Arch. of Int. Med., Feb., 1928), *hypochloremia* is an important feature of mercury poisoning. Dogs poisoned by intravenous injections of mercuric chloride suffer a marked reduction in the sodium chloride of the blood, owing to loss of chlorides through vomiting. This hypochloremia, though associated with a relative acidosis, produces *gastric tetany*. There is evidence that 2 per cent. salt solution administered intravenously may be of value by forcing excretion from the kidney. In the human patient poisoned with mercury, the danger of a low level of blood chlorides should be borne in mind. Care should, however, be observed in adopting certain treatments in man. Thus, C. C. Haskell, J. R. Hamilton and W. C. Henderson (Jour. of Lab. and Clin. Med., May, 1926) found experimentally in dogs that the exsanguination-transfusion method of treating mercuric chloride poisoning is distinctly injurious.

According to Haskell (Va. Med. Mthly.,

Mar., 1927), the various procedures proposed for the treatment of mercuric chloride poisoning, when subjected to a critical test, are, with scarcely an exception, found wanting. The safest way is to prevent absorption, and when the poison has been administered orally, this may be done by prompt and thorough **gastric lavage**. In the present state of knowledge, antidotes for mercuric chloride must be looked on as better fitted for affording mental solace to physicians and patients than as being capable of accomplishing detoxication.

Flury (Münch. med. Woch., June 18, 1926) found that mercury poisoning was possible with the old-fashioned *amalgams*, especially of copper for dental fillings, but not with the complex mixtures which are being used at present. About 1 mgm. ( $\frac{1}{65}$  grain) of mercury a day might cause mercurial poisoning. The amount of mercury contained in a filling could yield only fractions of a milligram if absorbed within 5 to 10 years. Stock, however, who has suffered together with his collaborators from chronic mercury poisoning due to the mere presence of mercury in his laboratory, which was not diagnosed until recently, points out that far smaller amounts of mercury—some hundredths of a milligram daily—may cause chronic poisoning in a few years. The symptoms are slight headaches, mental fatigue, impaired memory, irritability, restlessness, and chronic colds. He has learned recently of about 50 similar cases among chemists and physicists.

Rakusin (Münch. med. Woch., Feb. 25, 1927) finds that magnesium hydroxide is inferior to **charcoal** as an antidote in mercuric chloride poisoning.

**MERCUROCHROME.**—H. Wood (Jour. Tenn. State Med. Assoc., Feb., 1928) observed 3 cases of **blood-stream infection** from a mastoid abscess demonstrated by blood cultures that did not terminate fatally. In all 3 cases, everything that numerous consultations could suggest had been done without apparent improvement in the patient's condition. Permanent improvement began with the intravenous administration of mercurochrome-220 soluble, 6 to 20 c.c. of a 1 per cent. solution. In each case, 2 intravenous injections were given. In no case did any evidence of

nephritis follow the administration of mercurochrome. Urinalyses were made months afterward and were negative in all 3 cases.

In a patient with a positive **blood-stream infection**, from whom all possible foci had been removed, mercurochrome-220 soluble, according to H. H. Trout (Surg., Gyn. and Obst., May, 1926), is worth a trial. It is an added resource in these otherwise hopeless cases.

R. H. T. Mann (Jour. Ark. Med. Soc., Apr., 1927) obtained good results in 2 cases. One was a case of **lateral sinus thrombosis** following mastoidectomy for a hemolytic streptococcus infection. The 2d case was 1 of **lung abscess**. A 3-penny nail was removed from the right bronchus and immediately the boy, aged 6, began to cough up much offensive pus. Later, a large abscess of the lung developed and the boy's condition became progressively worse. Mercurochrome was injected intravenously and recovery ensued immediately.

In infections of the **genito-urinary tract** and in **chronic arthritis**, either gonorrheal or of other origin, C. D. Allen (U. S. Vet. Bureau Med. Bull., May, 1926) holds that there is a definite indication for the use of mercurochrome-220 soluble intravenously. He uses a cold, filtered, 2 per cent. mercurochrome solution, obtained by adding mercurochrome to distilled water. He starts with 2 or 3 c.c. of a 2 per cent. solution and increases 1 c.c. each dose up to 5 c.c., unless there is some imperative need for a larger dose. Thus undesirable reactions are avoided. Only 1 case of kidney irritation was encountered among the hundreds of patients dealt with.

K. F. Meyer, H. Sommer and B. Eddie (Jour. of Infect. Dis., June, 1926) found experimentally that mercurochrome-220 soluble, injected intravenously, was excreted in the hepatic bile of rabbits in concentrations which could destroy 10,000,000 typhoid bacilli in 6 to 24 hours. It failed, however, to cure experimentally produced gall-bladder carriers upon giving mercurochrome intravenously or by mouth.

Hengstler (Minn. Med., May, 1926) found mercurochrome of no value in the treatment of central nervous system infection, as illustrated by 3 cases of meningitis secondary to middle ear infection observed by the author.

**UNTOWARD EFFECTS.**—Macht and Harden (Jour. of Pharm. and Exp. Ther., Mar., 1928) found experimentally that this mercurial was about 3 times less toxic than originally claimed, and that on combining it with dextrose for therapeutic purposes, great care must be taken to combine or mix the 2 components only immediately before injection at the bedside of the patient, because *in vitro* mixtures of the two begin to interact, and cause precipitation of metallic mercury within 24 hours.

Animal experiments showed J. A. Mendelson (Med. Jour. and Rec., July 20, 1927) that neither sodium thiosulphate nor calcium sulphide can be depended on to act as antidotes for mercurochrome poisoning, and the efficacy of either in mercuric chloride poisoning is doubtful. Mercurochrome, after its injection into the blood stream, is beyond control by either of the 2 remedial agents in the doses used.

**METAPHEN.**—According to Raiziss and Severac (Jour. of Infect. Dis., Mar., 1927), metaphen possesses unusually high bactericidal properties, especially when left in contact with micro-organisms over 1 hour. It was then more effective than any of the other germicides they employed, while almost 4 times less toxic when injected intramuscularly. Its toxicity when given orally is also comparatively low. It is non-irritating in therapeutic dilutions. Both experiments in animals and clinical trials confirmed its high bactericidal efficiency.

**MORPHINISM.**—E. M. Scarborough (Jour. of Pharm. and Exp. Therap., June, 1926) found experimentally in the white rat that chronic morphine poisoning, when associated with thyroid feeding, is not accompanied by any accentuation of the depressant action of morphine on the central nervous system. The metabolic effects produced by combined chronic morphine poisoning and thyroid feeding are more marked than those produced by either drug alone, and resemble the effects of pronounced hyperthyroidism. The weights of organs

concerned in metabolism are low in chronic morphine poisoning. The combination of chronic morphine poisoning with thyroid feeding tends to check the hypertrophy of these organs which otherwise accompanies thyroid feeding. Chronic morphine poisoning is not associated with any change in the structure of the thyroid gland.

**TREATMENT.**—A modified application of Lambert's method is described by G. L. Scott (Pract., Jan., 1927). The treatment consists essentially in a far more gradual and cautious withdrawal of morphine covered by 2 successive periods of overdosage by a special mixture which contains equal parts of tincture of *belladonna* and the fluidextracts of *hyoscyamus* and *xanthoxylum*, given in increasing doses, and *phenobarbital*, respectively. It is spread over a period of 10 to 14 days. The reduction of morphine takes place *pari passu* with these 2 processes, and is timed to be completed when the maximum dosage of phenobarbital is nearly reached. Delirium is not produced, only a slight and transient confusion being aimed at. Distress should not be felt at any stage; there is nothing in the nature of a "crisis," and it remains to inform the patient 3 days afterward that he is morphine-free. Insomnia is rarely troublesome, and a proportion of patients regain normal sleep very rapidly. The treatment is discontinued at night.

**MULTIPLE SCLEROSIS.**—The incidence of multiple sclerosis among 5469 neurologic admissions is given by H. B. Conaway and F. C. Hill (Amer. Jour. Med. Sci., Oct., 1927) as 7 per 1000 (38 cases). In

1700 examinations of the brain and cord during the same period, the lesions of multiple sclerosis were found in 9 instances (5.3 per 1000). The ratio of males to females was 6 to 5. The average age of onset was 34, and the average age of death, 41½ years. The average duration of the disease was 9 years. There were possible etiologic or precipitating factors in 5 cases, *viz.*, injury in 2, alcoholism, childbirth, and influenza. In all there was a gradual onset and progression of symptoms, with remission in 5 cases, always in the early stages of the disease. The 2 symptoms present in all but 1 case were paraplegia and absent abdominal reflexes. Sensory disturbances were noted in 7 patients, and were mainly of the posterior column type.

**SYMPTOMS.**—Lhermitte, Lévy and Nicolas (Presse méd., May 14, 1927) describe as a separate symptom a species of vibration which suddenly courses along the spinal column and extremities; it is not a pain sensation, but has the unpleasant quality of the sensation resulting from application of the faradic current. The symptom does not occur when the subject is completely at rest, and seldom occurs during the sleeping period. It is brought on either by fatigue or by motion. The "discharge" is started exclusively by flexion of the head or forward bending of the trunk. When the phenomenon is marked, the patients cannot arrange the hair, stoop to pick up something, put on shoes, or even, sometimes, say "yes" emphatically, without being at once checked in their action by the "electric" vibration. One patient pointed out that the propagation of the sensation may be interrupted by compression

of a nerve; for example, if 1 leg is crossed over the other, the "current" fastens itself at the point of pressure and gives rise at that level to a peculiar form of discharge. Passive forward bending on the head and body likewise brings on the symptom. The authors ascribe it to a stretching of the spinal cord by the forward movement, the axis cylinders being abnormally sensitive and deprived of their ordinary myelin sheath. Later in the disease the symptom is no longer noticed; this may be because the axis cylinders have then become enclosed in a thick sheath of neuroglia which takes the place of the lost myelin.

Guillain and Alajouanine (Bull. de l'Acad. de méd., Mar. 20, 1928) report a case of *acute multiple sclerosis* in a young woman who suddenly developed an acute ataxia with diplopia and somnolence, then the clinical picture of acute sclerosis with predominance of mesencephalic manifestations, and finally a terminal syndrome of flaccid paraplegia similar to that of acute myelitis. Lumbar puncture revealed a slight meningeal reaction with a subpositive colloidal benzoin test and a negative Wassermann. In 3 weeks, at the end of which the patient died, the disorder thus covered a combination of 3 of the clinical pictures that multiple sclerosis may exhibit, *viz.*, the acute ataxic form, the mesencephalic form, and the myelitic form. The necropsy revealed quite typical lesions of multiple sclerosis.

The syndrome of acute ataxia, ordinarily subject to recovery, has at times been considered an abortive type of multiple sclerosis; apparently it can be brought on by varying in-

fections or toxic factors. The diplopia and somnolence in the 1st stage of the case reported suggested epidemic encephalitis. There is now an undue tendency to consider these 2 symptoms as being always due to encephalitis; actually, they indicate merely some lesion involving the region of the corpora quadrigemina, peduncles and third ventricle. Somnolence and diplopia occur in multiple sclerosis, syphilis, amyotrophic lateral sclerosis, and infectious or neoplastic involvements of this region. The authors do not agree with Bériel and Devic that epidemic encephalitis is an etiologic factor of multiple sclerosis. In the 2d stage the case reported assumed a diffuse pedunculopontobulbar type, with vertigo, nausea, vomiting, nystagmus, hypoacusia, tinnitus, dysarthria, gustatory disturbances, paralysis of the soft palate, and impaired motility of the muscles of the neck. This pedunculopontobulbar form of multiple sclerosis is rare.

**ETIOLOGY.**—Molhant (Bruxelles méd., Feb. 13, 1927) lays stress on the resemblance between syphilis of the spinal cord and multiple sclerosis. It is evident in the clinical picture, the serologic reaction and the course of the 2 diseases. The efficacy of arsenical treatment in multiple sclerosis reënforces the analogy. Again, multiple sclerosis is rare in children. In a girl, aged 6, observed by Pons Navarro (Med. de los niños, May, 1927), syphilis was apparently a factor in the etiology; the patient improved somewhat under **arsenical and electric treatment**.

Blood examinations by O. Kauffmann (Arch. f. Psych. u. Nerv., Jan. 10, 1928) in 73 cases of multiple sclerosis disclosed the usual **pseudo-spirochete**.



Inoculation of guinea-pigs, mice and monkeys, with the blood and spinal fluid of sclerotic patients was undertaken to observe the possible disease-producing effects. Most of the guinea-pigs injected died. Two showed spastic paraparesis of the lower extremities and convulsions. The pathologic picture was limited to an encephalomyelitis which was histologically identical with guinea-pig paralysis. An experiment in the transmission of human poliomyelitis to guinea-pigs was successful and was confirmed by the histologic picture.

**TREATMENT.**—In a trial of the **fever treatment** of multiple sclerosis, Dreyfus and Hanau (Deut. med. Woch., Mar. 5, 1926) gained a decidedly favorable impression in 11 out of 12 cases.

In 5 cases that J. W. Stephenson (Phys. Ther., Apr., 1927) treated by **diathermy**, 2 showed distinct evidences of exaggeration of symptoms referable to morbid changes within the cranial cavity, without evidence of an increase of the symptoms referable to spinal cord involvement. The author considers that this indicates a control of the spinal cord disease by diathermy.

**MUMPS.**—As evidence of the severity of the pathogenic agent of this disease, Sabrazès, Broustet and Beaudiment (Gaz. hebd. des sci. méd. de Bordeaux, Nov. 6, 1927) cite the case of a boy, aged 19 years, who, on about the 5th day of an attack of mumps, escaped from the hospital during the night and walked about 4 miles. He died 2 days later with symptoms of acute nephritis. At necropsy the pancreas was found enlarged and histologically showed a massive necrosis. The intense acute nephritis, the infectious liver, the

congestion and acute edema of the lungs, and the slight meningeal lymphocytosis found were attributed to the mumps.

**TREATMENT.**—Too little attention is paid by practitioners to the destructive influence of this disease upon both the male and female genital organs, the testes in particular, to which are attributable many instances of sterility.

Coutts and Vicuña (Rev. de la Soc. de urol., Oct., 1925) found that **auto-hemotherapy** had a prompt and decided influence on the *orchitis* and other genito-urinary complications of mumps in a recent epidemic. One of the 5 young men treated had extreme congestion of the prostate in addition to orchitis and epididymitis, and retention of urine compelled catheterization. They injected 5 c.c. of own blood 4 or 5 days in succession. The fever dropped at once after the 1st injection.

Molinelli (Semana méd., Mar., 1926) tried neoarsphenamin or other arsenicals in 100 cases of mumps, Kermorgant having claimed that he had found a spirochete as the **causal agent of the disease**. The results were entirely negative; complications developed in the usual ratio, and no preventive or curative action was apparent.

**MYOCARDITIS.**—J. S. Goodall and L. Rogers (Lancet, Mar. 5, 1927) assert that sustained *thyrotoxicosis* ultimately results in definite myocardial degeneration. Electrocardiographic observations by these authors (Brit. Med. Jour., June 25, 1927) in 787 cases of thyroid hearts, brought out the fact that 242 cases showed impaired conduction in the bundle of His; 184, left-sided preponderance; 113, a modification of the T wave in

the 3d lead; 108, right-sided preponderance; 91, auricular fibrillation; 46, modification in the T wave in Lead II; 33, modification in the R-S complex; 23, modification in the T wave in Lead I; 19, ventricular extrasystoles; 5, right branch block, and 5, auricular extrasystoles.

**TREATMENT.**—A striking feature of the treatment of myocarditis, according to C. Bernard (*Monde méd.*, Apr. 1-15, 1928) is the inefficiency of the usual cardiac tonics, digitalis, strophanthus, etc. The influence of the endocrin organs on the heart and circulation suggest that it is in organotherapy that the required support of the weakened myocardium is to be found. The author, therefore, administers in myocardial cases a combination of **suprarenal gland**, 0.1 Gm. ( $1\frac{1}{2}$  grains), and **thyroid**, 0.025 Gm. ( $\frac{1}{3}$  grain), in a capsule morning and evening. Added to the commonly used heart stimulants, the

good effects of this combination soon manifest themselves.

**MYXEDEMA.**—The important relations between this disorder, *i.e.*, deficient activity of the thyroid gland, and the *menopause* are insufficiently realized by practitioners. Gardiner-Hill and Forest Smith (*Lancet*, Apr. 23, 1927), in a searching analysis of 59 cases of myxedema, found that it developed before the natural menopause in 56 per cent. and after the menopause in 44 per cent., and that when myxedema developed before the natural menopause, menorrhagia was present in 78 per cent. of cases. They found, moreover, that myxedema is a common sequel to the artificial menopause when the latter has been resorted to for menorrhagia without apparent local cause. They report 15 cases and suggest the probability that the menorrhagia, in some of these patients at least, was an early symptom of myxedema.

## N

**NEPHRITIS, ACUTE.—SYMPTOMS AND DIAGNOSIS.**—In Capon's (*Arch. of Dis. in Childh.*, June, 1926) experience, *renal efficiency tests in children* have not furnished any diagnostic information of importance, though at times helpful in determining the degree of the lesion and its progress. They are of real value, however, in prognosis and in directing diet and treatment. The tests must be repeated and taken into consideration along with clinical and other laboratory examinations. Continued nitrogen retention is of importance and denotes serious injury,

while a persistently low phenolsulphonphthalein excretion is also serious.

Six deaths occurred among 22 cases of acute parenchymatous type, and 1 death, from other causes, among 27 cases of *acute hemorrhagic nephritis in children* reviewed by D. Paterson and W. J. Wyllie (*ibid.*, Apr., 1926). The importance of reëxamination at an interval of years is urged in view of the difference in the conclusions which may be based on an immediate prognosis as compared with the results of later investigations. From a general examination the immediate prognosis seemed good in 13 cases of

parenchymatous nephritis and in 26 cases of hemorrhagic nephritis. After a period of from 3 to 5 years, only 5 of the parenchymatous patients could be said to have recovered completely, as compared with 12 recoveries in the hemorrhagic group. Six of the parenchymatous and 9 of the hemorrhagic patients appeared to be in good health, but had albuminuria and abnormal cellular constituents in the urine. The degree of albuminuria and the quantity of cells present were found definitely less in the hemorrhagic type than in the parenchymatous cases. Four out of 6 cases of post-scarlatinal nephritis became chronic. The authors emphasize the importance in post-nephritis of the presence of even a very slight trace of albumin when it is associated with an excess of cells in the centrifugalized deposit.

**ETIOLOGY.**—Newburgh (Ann. of Clin. Med., June, 1926) sees little hope of finding the cause of this disease in the field of focal infection.

To ascertain the rôle of *bacterial toxins* in acute nephropathies, Dake (Mitt. ü. allg. Path. u. path. Anat., Apr. 18, 1926) examined the blood and urine, especially for chlorine and nitrogen, of rabbits inoculated with various bacterial toxins or bacteria or injected with a chemical. As to the 2 theories of the origin of the increase of residual nitrogen in the blood, the renal retention theory and the extrarenal theory (increased catabolism of body protein, disturbance of liver function, etc.), the experiments showed that both mechanisms worked together. They also confirmed the extrarenal cause of renal edema. All poisons attack the extrarenal vessels directly. The author found heightened sensitivity

to various cocci and to diphtheria bacilli in rabbits previously treated with the corresponding bacteria or toxins, but in the case of typhoid and paratyphoid B. bacilli the opposite was true. This agrees with clinical experience. In tonsillitis, scarlet fever and diphtheria, there is an incubation period, but in disease of the kidney accompanying typhoid or paratyphoid no such incubation is apparent.

According to Krokiewicz (Virchows Arch., Nov. 3, 1927), excessive *indicanemia* in cases of nephritis has prognostic value inasmuch as uremia rarely, if ever, occurs when hyperindicanemia is not present. Increase in residual nitrogen is usually also present in these cases, but unless hyperindicanemia exists, it is not of prognostic value as regards the development of uremia.

**TREATMENT.**—The value of the *inlying ureteral catheter* in the treatment of acute and chronic *pyelonephritis* as a method of drainage of the renal pelvis by non-operative means is not as well known as it deserves to be, according to D. N. Eisendrath (Trans. Amer. Med. Assoc., May, 1927). It is of the greatest value in acute cases, but recently has been applied both as a method of preparation of bad operative risks and in other forms of less acute infection. There is a tendency for the catheters to be spontaneously expelled unless some provision is made for constant evacuation of the bladder. The catheters can be left *in situ* for a much longer period than was deemed advisable in the past.

Vivanco (Rev. med. Latino-Amer., Aug., 1927) reports 8 cases to show the improvement following *venesection* in acute uremia and nephritis.

**NEPHRITIS, CHRONIC.—**  
**DIAGNOSIS.**—A study of the *intra-dermal salt solution test* made by Feldman and Reifsneider (Arch. of Int. Med., Jan., 1928) in 18 cases of nephritis in adults showed that the wheals caused by the salt solution disappeared in less than 30 minutes, except in 1 case (alkalosis), only when edema, or a history of edema, was present. A decreasing disappearance time was associated with an unfavorable progress of the condition, and an increasing time with improvement; a very short time, which persisted in spite of treatment, was of bad prognostic significance. There was no close relationship between the retention of nitrogen and the sodium chloride and cholesterol content of the blood, on the 1 hand, and the disappearance time on the other.

Coope and H. W. Jones (Brit. Med. Jour., Jan. 8, 1927) examined the simplest test of renal function (the *urea concentration test* of Maclean and de Wesselow) in order to ascertain its value for prognosis. For immediate prognosis it did not prove of great help, but it afforded definite help in forming a general prognostic judgment in a nephritic case. The authors lay much more stress on blood examination than on any test involving urinary analysis.

*Acidosis*, often observed in both acute or chronic nephritis, is best made manifest, according to Rathery, Trocmé and Marie (Presse méd., July 23, 1927), by the *sodium bicarbonate test*. Lowering of the alkali reserve occurs concomitantly, often with modifications of the azotemia; with raised azotemia there is often a lowered alkali reserve. All of their patients who had an alkali reserve of

20 died in a few days. The examination of the alkali reserve shows the intensity of the phenomena of acidosis. The single examination of the urinary pH made in the morning, fasting, is insufficient. The pH of several of the cases reached and exceeded 7.

**SYMPTOMS.**—Kollert (Zeit. f. klin. Med., Oct. 14, 1927) emphasizes the fact that *hypertension* and *narrowing of the vessels* are the essential factors in the origin of nephritic *retinitis*. A fall in blood-pressure in the course of the disease is a favorable prognostic sign as to life; even recovery may occur. Similarly, the retinal arteries, narrowed in progressive retinitis, incline to become normal in the stages of recovery. In glomerulonephritis, with or without retinitis, the sedimentation rate of erythrocytes is almost constantly increased. Decrease of the rate is a favorable prognostic sign, even with continued hypertension. Deposits of cholesterol esters in the eye frequently occur with hypercholesteremia, but only when retinal disease is already present.

T. I. Bennett (Lancet, Mar. 31, 1928) believes that *edema* in nephritis indicates pathologic changes in tissues other than the kidney, and that such pathologic changes are not the result of nephritis, although it is more than probable that the renal and extrarenal injuries have a common cause.

**TREATMENT.**—Basch (Zeit. f. Kind., Dec. 23, 1926) found that in 10 out of 11 nephritic children his sodium iodide test showed an average increase of 50 per cent. when the patient was allowed **active movements** to improve diuresis when medication failed even though the condition was



fibrous or there was albumin or blood in the urine.

In a case of chronic nephritis, with acute depression of renal function, treated by **parathyroid extract** by E. H. Mason (Can. Med. Assoc. Jour., May, 1926), the serum calcium returned to its normal level, with a remarkable readjustment of the altered blood chemical determinations.

W. Hirschfeld (Arch. f. Kind., Nov. 11, 1927) tried the **sugar** treatment of nephritis in *children* and found it of value only in cases with uremia or in which uremia was imminent. No effect on the albuminuria or hematuria attributable to the sugar was noted.

As to the **dietetic treatment**, M. Smith (Boston Med. and Surg. Jour., Apr. 21, 1927) states that diets of lower protein content than are commonly used in chronic nephritis with nitrogen retention are feasible. The amount of protein allowed in the diet should be based on the amount of non-protein nitrogen which the patient is able to excrete during 24 hours. If the nitrogen retention is to be relieved, the protein nitrogen in the diet should be less than the total 24-hour content of non-protein nitrogen in the urine. When the 24-hour nitrogen excretory capacity of the kidneys equals the amount of endogenous nitrogen catabolism, it will be impossible to relieve nitrogen retention by dietary measures. The same author (*ibid.*, June 9, 1927) cites a case of chronic nephritis in which an average daily protein intake of 0.26 Gm. per kilo ( $2\frac{1}{5}$  lbs.) of body weight sustained a boy, aged 17, for 6 months without untoward effects.

Kappis (Zent. f. inn. Med., Feb. 12, 1927) contends that the question of

**surgical treatment** of chronic nephritis is as yet undecided. The results of **decapsulation** are good in *nephralgia* and in *repeated hemorrhagic nephritis*. It might be tried in *acute glomerulonephritis* that does not show a definite tendency to heal in 2 or 3 months. *Acute anuria* is another indication for surgical intervention, which should not be delayed for more than 2, or at the utmost, 3 days.

Damski (Jour. d'urol., Mar., 1926) resorted to **operation** in 24 cases. A definite cure resulted in 40 per cent.; improvement, in 30 per cent. Four died after the operation. Comparing his cases with 110 on record, he concludes that a radical operation, possibly nephrectomy, is advisable in *unilateral hemorrhagic nephritis*, while expectant treatment should be the rule in ascending nephritis, unless there is grave retention of urine or infection. Painful nephritis with hematuria should be treated surgically, **decapsulation** with **nephropexy** being the method of choice in *nephroptosis*. In cases with *tuberculosis* of 1 kidney and painful nephritis of the other, removal of the 1st kidney might be followed by decapsulation of the other. Decapsulation may induce persistent improvement in acute nephritis rebellious to medical treatment, but he never witnessed complete recovery. More harm than good will be done in chronic nephritis with cirrhosis and arterial hypertension if an operation is resorted to.

#### NEPHRITIS, GLOMERULAR.

—**SYMPTOMS.**—According to Blackfan (Johns Hopk. Hosp. Bull., Aug., 1926), increased arterial tension and the development of uremic cerebral symptoms are characteristic events in

acute glomerular nephritis, whereas generalized edema without rise in blood-pressure is the outstanding feature in acute tubular nephritis. In acute glomerular nephritis, red blood cells are conspicuous in the urine; the plasma protein is normal and the non-protein nitrogen tends to increase in the blood. In acute tubular nephritis large amounts of albumin and lipid substances are found in the urine; the plasma protein is low and the non-protein nitrogen in the blood is normal. In 11 cases of uremia in children with acute glomerular nephritis observed by the author, the nephritis followed tonsillitis or acute respiratory infections. In addition to the cerebral symptoms (vomiting, headache, visual disturbances, coma or delirium and convulsions), there was hypertension, hematuria and visible though not necessarily marked edema.

Bannick (Arch. of Int. Med., May, 1927) observed 2 cases of severe chronic glomerular nephritis without hypertension, cardiac hypertrophy or retinal changes. One case, in which autopsy was permitted, complained of malaise, slight anorexia, and some loss of weight and strength. He became profoundly weak and began to vomit soon after eating. He died from uremia.

**ETIOLOGY.**—Longcope, O'Brien, McGuire, Hansen and Denny (Jour. of Clin. Invest., Dec. 20, 1927) studied the influence of *infections* in the genesis of glomerular nephritis in 40 patients, in 80 per cent. of whom tonsillitis, sinusitis, bronchopneumonia or scarlatina had acted as cause. Cultures made in 32 cases showed hemolytic streptococci of  $\beta$  type in 68.7 per cent. and streptococci of  $\alpha$  type in 12.2 per cent. Ten patients among

those who could be constantly observed recovered apparently from the attack of acute nephritis. In 2 of these, the infection and the infecting organism had disappeared. In 12 cases among those that could be constantly observed, the condition progressed to a chronic stage or terminated fatally. In 10 of these, or 83.3 per cent., the infection or the infecting organism had persisted. No evidence could be obtained to show that the streptococcus caused the glomerular nephritis by actual invasion of the kidney, for cultures of the blood and urine were negative.

According to Fahr (Deut. med. Woch., Apr. 30, 1926), toxic swelling of the endothelial cells of the glomeruli—not a spasm of the vas afferens—is the primary lesion in glomerular nephritis. He concedes that there are more leukocytes in the efferent vessel than in the afferent, but this is due to the narrower wall of the former predisposing to stasis, not to a retrograde immigration of leucocytes.

**TREATMENT.**—Blackfan (*loc. cit.*) states that the patients referred to were treated during the uremia or the cerebral symptoms in children, with **intravenous injections of a 1 per cent. solution of magnesium sulphate** and by the administration of large amounts of **magnesium sulphate** by mouth and by rectum.

**NEPHRITIS, TUBULAR, OR NEPHROSIS.**—The term “nephrosis” is applied to cases in which a profound metabolic disturbance exists. The pathologic changes in the kidneys (tubular degeneration) are, according to A. A. Epstein (Jour. Amer. Med. Assoc., Sept. 18, 1926), the consequence and not the cause of the

metabolic disturbance. Cases of chronic nephrosis exhibit an unusual tolerance for thyroid and thyroxin. The response to thyroid therapy is best measured by the cholesterol content of the blood. Thyrotoxic symptoms do not occur as long as a hypercholesterolemia exists. Certain cases of chronic nephrosis are susceptible of complete cure by the intelligent and persistent use of **high protein feeding** and **thyroid** therapy, though this treatment may require a year or more to accomplish. Hence the clear distinction between this and other forms of nephritis.

Among 53,965 sick children treated during the past 15 years in the Harriet Lane Home and reviewed by W. C. Davison and R. Salinger (Johns Hopk. Hosp. Bull., Dec., 1927), 26 were diagnosed as having nephrosis. Of the 20 patients regarding whom definite information is at hand, 6 are well, and 5 of these had been so for more than 7 years, while 6 are dead. In 8, the disease is still active, and recovery may eventually take place. These cases indicate that (1) tubular nephritis (nephrosis) is a clinical as well as a pathologic entity, which can usually be recognized by its clinical course; (2) the etiology is as yet unknown; (3) the prognosis is better than other reports would seem to indicate, although the duration may be long and several years may elapse before the patient may be permanently free from edema and albuminuria, and (4) at autopsy the tubules of the kidney are more markedly implicated than the glomeruli and interstitial tissue, although they, too, are injured.

**TREATMENT.**—In 2 cases of chronic nephrosis reported by Scriver (Jour. of Clin. Invest., Aug. 20, 1928),

the excretion of calcium in the urine was found to be extremely small. Administration of **parathyroid extract** caused a marked increase of calcium elimination by the feces, but had practically no effect on its excretion with the urine. The period of augmented excretion corresponded with increase of an already low calcium in the serum. It required relatively large doses of parathyroid extract to increase the serum calcium values; in 1 case these were still below normal in spite of large doses of a proved potent extract.

J. R. Davidson (Can. Med. Assoc. Jour., Feb., 1928) observed 3 cases of nephrosis of thyroid origin. In 1 uncomplicated case of thyroid nephrosis of long standing, material improvement was obtained by **thyroid** treatment. Another case failed to respond to thyroid alone, but with the addition of Collip's **parathyroid extract** yielded readily and was controlled afterward with thyroid. The 3d case was associated with pregnancy; in this case, after 4 unsuccessful pregnancies, the 5th, controlled by thyroid medication, was successfully terminated with the birth of a normal child.

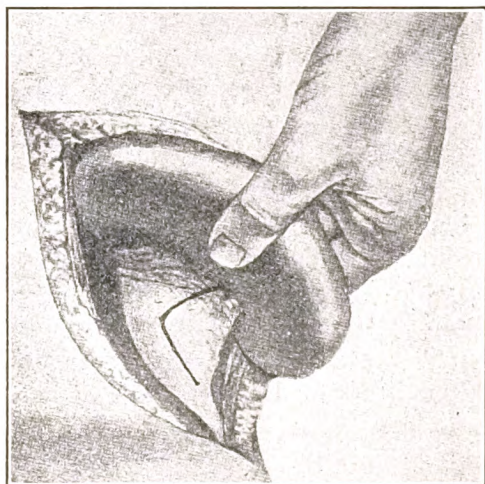
In nephrosis with edema in children, Stolte and Knauer (Jahrb. f. Kind., Jan., 1927) used **Epstein's diet** with success. Albuminuria and edema were present, but with approximately normal amounts of residual nitrogen and low blood-pressure. The edema as well as the albuminuria is improved almost immediately after the administration of meat.

**NEPHROLITHIASIS.**—In a case observed by Vallino (Arch. Latino-Amer. de ped., Nov., 1926) in a girl 14 years old, the only sign of



renal calculus for 9 years had been occasional blood in the urine. Neither pain nor tenderness developed at any time. A tentative diagnosis of nephrolithiasis was confirmed by the X-rays.

Kleiber (Zent. f. Chir., Feb. 26, 1927) observed a case in which the right kidney contained a calculus filling the entire pelvis, but there were no renal symptoms and the kidney continued to function, whereas there had been attacks of colic in the left kidney and indigocarmine tests



Enlarged pyelotomy incision for removal of renal calculi. (Hamer, in *Boston Med. and Surg. Jour.*)

had shown a temporary complete cessation of function in this organ.

In a case of recurrent urinary lithiasis in a physician observed by Hinman and T. E. Gibson (*Jour. of Urol.*, July, 1926) there was rapid recurrence of the stones after repeated removal; there were frequent attacks of anuria with a high blood nitrogen retention. Despite the almost complete destruction of renal tissue, the patient was able to carry on active practice. Death finally took place, but was apparently not of renal

origin, but due to sudden cardiac failure.

Radiographic simulation of renal calculi by skin papilloma occurred in 2 cases reported by Melicow and Gile (*Surg., Gyn. and Obst.*, Feb., 1927).

**TREATMENT.**—According to H. G. Hamer (*Boston Med. and Surg. Jour.*, Nov. 10, 1927), enlarged **pyelotomy** seems justifiable for those stones that have a coral-like appearance but do not penetrate into the kidney for more than a slight depth. In these cases, a single incision, curved or angular, or a Y-shaped incision, the branches of which injure the kidney very little, suffice for the extraction of the stones. In undertaking this procedure it is necessary to have a roentgenogram that demonstrates clearly the characteristics of the stone and leaves no doubt as to its shape and direction.

**NEURALGIA.**—Changes in the Gasserian ganglion cells, as indicated by partial or entire failure to stain, atrophy or hypertrophy, protoplasmic basophilia, vacuole formation and breaks in the cell walls were discerned by Lignac and van der Bruggen (*Ned. Tijd. v. Gen.*, Aug. 27, 1927). Perinuclear pigment and a perinuclear areola, chromatolysis, karyolysis and disappearance from the capsules of the ganglion cells were also noted. In the nerve fibers, the changes included swelling of the fiber and of the medullary sheath and degenerative changes in the nerve vessels.

The diagnostic significance of trigeminal neuralgia in apparently cured *otitis media* is stressed by Uffenorde (*Münch. med. Woch.*, Dec. 3, 1926). The inflammation sometimes invades the pneumatic cells of the middle ear,



which may reach as far as the tip of the petrous bone. It seems that the tympanic nerve, which originates in the petrosal ganglion of the glossopharyngeal nerve and constitutes the sensory root of the otic (trifacial) ganglion is responsible for the neuralgia.

**TREATMENT.**—Walter and Lax (*ibid.*, Apr. 16, 1926) express astonishment that the **X-rays** are so seldom used in the treatment of *trifacial* neuralgia. They had 19 patients cured by it among 29 cases, 6 considerably and 2 distinctly improved. The 1st exposure frequently causes an exacerbation of the pains.

The technic seems to play a part of considerable importance in the success. That employed in the Rostock University surgical clinic, according to Breitländer (Zent. f. Chir., Dec. 11, 1926), is as follows: The Gasserian ganglion alone is irradiated. He uses 182 kilovolts, 4 milliamperes, filtration through 0.5 mm. of zinc plus 1 mm. of aluminum, focal distance 30 cm., diameter of field of irradiation, 5 cm. The dose of the field of irradiation is 30 per cent.; the focal dose at the ganglion, about 10 to 15 per cent. of the erythema dose. This treatment is repeated as found necessary, usually once or twice, even in the most successful cases. An interval of 4 weeks is allowed between irradiations. When repetition of the irradiation is contraindicated by danger of injury to the skin, an effort is made to reach the ganglion from the other side. In 57 cases the author found this to be the safest method of treating trigeminal neuralgia. Patients should be warned that during the first 24 hours the reaction—increase of pain—will be quite severe.

In the treatment by **alcohol**, Kulenkampff (Münch. med. Woch., May 27, 1927) ascribes scar formation to the use of excessive amounts. He 1st injects only a few drops of a 2 per cent. solution of **procaine hydrochloride**. The instantaneous disappearance of pain indicates the correct or almost correct position of the needle. After this he injects 0.25 c.c. (4 minims) of **alcohol**. If it is painful, the localization is not perfect and 0.5 c.c. (8 minims) may be necessary. He leaves the needle in place, and removes it after a few hours if the pain does not return. Otherwise he repeats the injection.

Hoppe (*ibid.*, Dec. 9, 1927), who employs Härtel's method with 70 per cent. **alcohol**, dose 0.5 c.c. (8 minims), reports his results in 125 patients, including ambulant cases, in 33 of whom a follow-up examination was possible. He obtained 18 permanent cures of more than 12 years, 2 of over 9 years, 1 of over 8 years, 4 of over 6 years, 2 of over 5 years, 3 of over 4 years, and 1 of over 3 years. All had total anesthesia when discharged. Of 18 discharged with partial anesthesia, 2 have remained free from attacks for 5 years, and 3 were symptom-free till their death in from 8 months to 7 years. G. Bauer (Hygiea, July 15, 1926) uses the Härtel technic except that when the needle has reached the ganglion it is withdrawn back a trifle. Of 24 patients, 13 were permanently cured, and all but 6 were much improved.

Nasaroff (Zeit. f. Chir., Apr. 16, 1927) treats trigeminal neuralgias by moistening the carotid artery with 80 per cent. **alcohol**, and found this successful in 3 cases. In 1, alcohol injections had been made without result.

As to the **surgical treatment**, C. H. Frazier (Trans. Amer. Med. Assoc.,

May, 1927) reiterates that major trigeminal neuralgia seldom involves other than the 2d or 3d divisions, one or both. There is no reason, other than in exceptional instances, why the entire sensory root should be sacrificed, and many reasons why it should not. His experience has proved beyond any reasonable doubt that fractional section is readily performed and gives permanent results.

**Section of the 2d and 3d divisions of the trifacial nerve**, according to B. Hughes (Brit. Med. Jour., May 8 and 15, 1926), is the operation of choice, as there have been no recurrences after 4 and 5 years in his cases. This seems to support the theory that the condition is sympathetic in origin, and that the afferent cell stations are situated in the sympathetic ganglia. An attempt should be made to save the motor element of the 3d division.

By **differential section**, Stookey (Ann. of Surg., Feb. 1928) means section of the fibers within the dorsal root central to the ganglion derived from the division producing the pain without section of the remaining fibers. Both the anesthetic area and the attendant paresthesias are thus reduced to a minimum, aside from the satisfactory results obtained.

**NEURASTHENIA.**—According to H. C. Sharp and J. W. Visser (U. S. Vet. Bur. Med. Bull., Apr., 1927), the so-called functional disorders of irritable heart, pseudo-angina pectoris, and paroxysmal tachycardia; irritable colon, constipation, and flatulence; hypotension, hypertension, and angioneurotic edema; menstrual difficulties and disorders of the sexual function, are especially likely to be accompanied by neurasthenic symptoms. Ill-defined endocrinopathies, blood dyscrasias, diseases of the genito-urinary tract, quiescent tuberculosis, early diabetes, and focal infections are also frequent etiologic factors.

The dominating importance of the *endocrin organs* is emphasized anew by T. A. Williams (So. Med. Jour., Oct., 1926). Adrenal inadequacy is an essential feature of the morbid process. It must be carefully distinguished from the asthenia of myocardial inefficiency. Deficient pituitary functioning, the metabolic asthenias, the melancholic phase of cyclothymia, dementia precox and psychogenetic asthenia have all to be differentiated from neurasthenia to insure the best results.

**NEWBORN, DISEASES OF. CEPHALHEMATOMA.**—**Evacuation** of a cephalhematoma, properly performed, is devoid of risk, according to Potocki (Bull. de l'Acad. de méd., Mar. 23, 1926), and of great advantage in certain cases, *viz.*, where the extravasation is extensive, especially if it occupies the whole parietal area, and if its absorption is delayed. The copious extravasation, especially if bilateral, causes a more or less severe anemia, and its absorption may induce icterus. Infants with cephalhematoma require constant care to avoid inflammation following slight trauma to the hematoma, and run considerable risks in this connection when they leave the hospital before the condition has healed. Again, the deep surface of the periosteum in the hematoma may lead to ossification while the periosteum is still elevated by the blood, whereupon the tumor can no longer subside unless the bony shell is crushed down. These complications can be avoided by puncture at the proper time. There are two risks from puncture, infection and hemorrhage. Infection is obviated by careful surgical technic, and

the author has had no trouble from it even in open operations on the newborn for the raising of depressed areas of the cranium. Recurrence of hemorrhage after evacuation by puncture is readily avoided, not by a tight bandage about the head, but by **adhesive strips** applied over the hematoma and a short distance beyond its margins.

In puncturing hematomas that were large or slow in absorption the author usually withdrew 30 to 50 Gm. of blood. In no case was there any recurrence of hemorrhage, and in all instances the results were excellent. There was always a little blood and clots remaining after the puncture, but absorption was nevertheless complete within a week. With this satisfactory experience, he employed puncture also earlier in the course of hematomas, while the extravasation was still going on. In the first of such cases 60 Gm. of blood were withdrawn. An assistant made pressure over the area while adhesive strips were promptly and firmly applied. Next day there was no increase of tension and when, 6 days later, the dressing was taken off all swelling had practically disappeared. Like favorable results were obtained in other cases thus dealt with early. The continuous compression with adhesive strips is the essential factor in the successful treatment.

**INTRACRANIAL HEMORRHAGE.**—Of approximately 200,000 infants who died in 1926 during the 1st year of life, 60,000, according to Womack (*So. Med. Jour.*, Mar., 1927), died in the 1st week and 25,000 in the 2d. It is estimated that 50 per cent. of these children died from intracranial and visceral hemorrhage. The

writer suggests, in reporting 1 case, that the blood coagulation time, or bleeding time, and the calcium estimation of the blood taken for both mother and infant before and after delivery, might be of value.

That intracranial hemorrhage is an important factor of the mortality in the newborn is shown by the fact recorded by T. C. Greene (*Boston Med. and Surg. Jour.*, Jan. 12, 1928) that out of 177 infants dying before or shortly after birth, 55 died from it. Breech extraction took the leading place as cause. In 22 patients there was no hemorrhage elsewhere in the body, although 1 child was a definite bleeder. In 13 cases hemorrhage was evident in other parts of the body, especially in the adrenals.

**TREATMENT.**—According to R. S. Beveridge (*Arch. of Dis. in Childh.*, Feb., 1928), after a study of 24 cases, the most efficient and satisfactory treatment is the injection of **whole human blood**. **Transfusion** is essential in all cases in which constitutional symptoms are severe.

In a case of hemorrhage from the mouth and rectum of an infant 24 hours old, heroic doses of calomel—6 grains (0.4 Gm.) in 3 days—recommended by R. I. Hutchinson (*Brit. Med. Jour.*, Oct. 8, 1927), enabled the child to survive.

**HEART-FAILURE.**—Reanimation of the heart of the newborn is being increasingly resorted to. After failure of the usual measures, Garipuy and Mériel (*Presse méd.*, Feb. 10, 1926) injected into the heart 1 c.c. (16 minims) of 1:1000 **adrenalin** solution in a newborn infant with white asphyxia. The heart beats recurred as soon as the injection was finished. **Artificial respiration** and **traction on**

the tongue were continued for 15 minutes longer, when normal respiration was established permanently. The authors urge that the intracardiac injection be used by obstetricians as a routine procedure, the method being easy, rapid and highly effectual. Wachenfeldt (Monats. f. Geb. u. Gyn., Feb., 1926) also had a perfect result with intracardiac injection of 0.5 to 1 c.c. (8 to 16 minims) of **adrenalin**

(1:1000) in 2 apparently stillborn children.

According to F. Israel (Zeit. f. Geb. u. Gyn., Sept. 9, 1927), the **electric current** as a means of producing respiratory movements in children born asphyxiated is undeservedly neglected, and he reports 3 clinical cases in which the faradic current proved successful after other methods of starting respiration had failed.

## O

**OBESITY.—DIAGNOSIS.**—As an editorial writer (Jour. Amer. Med. Assoc., Aug. 27, 1927) says: "These are days of discomfiture in many respects for persons who are currently classed as overweight." He might have added that a similar remark is applicable to the clinician. The old notion that we are dealing merely with deficient catabolism of fats and overfeeding, and that thyroid feeding, by enhancing basal metabolism, should be effective, has proved as disappointing to the patient in most instances as it does to the physician. A. Bassler (Phys. Ther., Apr., 1928) emphasizes the fact that we are dealing in obesity with 1 or more manifestations of ill-health, and that in each case it is not a question of "reducing fat," but of careful differentiation as to the cause of the adiposis. It may be due to a high systolic blood-pressure; to a hypercholesteremia, in which ample and frequent feeding is necessary; to perverted metabolism, observed in gout, rheumatism, etc.; or it may be an aftermath of pregnancy due to a marked stimulation of the nutritive functions. Functional endogenous or exogenous disorders may underlie its

development; here the endocrin organs must be taken into account. Briefly, the author does not reduce unless there is a clinical reason for it.

J. L. Masterman-Wood (Pract., Sept., 1927) divides the various forms of obesity into the following classes as regards the endocrin organs: (1) Pure posterior pituitary insufficiency; (2) bilobular pituitary insufficiency (Fröhlich's syndrome); (3) pure thyroid insufficiency (myxedema); (4) thyro-pituitary insufficiency (pituitary hibernation); (5) pure gonadal insufficiency; (6) thyro-pituitary-gonadal insufficiency.

In the uncomplicated complete hypogonadism the panniculus adiposus is confined to the breasts, the sides of the chest from the axilla to the iliac crest, mons, and upper and outer 3d of the thigh, which includes an area extending from just below the lateral margin of the iliac crest to an approximately equivalent distance below the great trochanter with its peak opposite the latter bony prominence.

According to L. N. Boston (Amer. Phys., Feb., 1926), children who are overweight at birth, or who do not develop in accordance with Holt's



table of standard weights and measurements for the various ages from birth to 4 years, should arouse suspicion as to some *endocrin* disorder. An X-ray study of the bony structures serves as an invaluable measure in determining the cause. Anthropometry should be employed in connection with every patient when there is any room for suspicion as to overweight or underweight. Inspection reveals the most important clinical features in juvenile adiposity. The overfat child is never healthy, and the baby with an unusual distribution of fat about its neck and chest rarely develops to normal manhood or womanhood. The distribution of fat in the panniculus serves, in a great measure, to placard the type of endocrin disturbance present.

An investigation of a large number of cases of obesity as to their *carbohydrate metabolism*, using the method of the blood-sugar curve and the respiratory exchange, enabled M. W. Goldblatt, J. F. Smith and H. Gardiner-Hill (Quart. Jour. of Med., Jan., 1928) to conclude that the only distinction from the view point of carbohydrate metabolism which can be drawn between cases grouped clinically and etiologically as exogenous and endogenous is that, in the early stages of the endogenous, there exists a markedly increased carbohydrate tolerance as regards both storage and oxidation, which does not exist in the exogenous.

**TREATMENT.**—In a review of the recent literature, L. Bauman (Jour. Amer. Med. Assoc., Jan. 7, 1928) states that most of the experiments show a relatively decreased heat production in the obese after protein feeding. The administration

of **pituitary, anterior lobe**, increased specific dynamic action; in some others, however, it was found that it tended to lower basal metabolism and should, therefore, be combined with **thyroid**.

Hofbauer (Fortschr. d. Med., Apr. 29, 1927) found that administration of preparations representing the whole gonad substance and a moderately restricted **diet** actually brought about a loss of weight amounting to 20 pounds in 10 weeks. Whole **testicular**, as well as **ovarian, preparations** were employed according to the sex of the patients, and were successful in both men (number not given) and women. The writer concludes that the reduction in weight was brought about by the improved metabolism which was induced by the gonadal therapy. There occurred also a steady lowering of the systolic blood-pressure.

Langdon-Brown (Endocrin. Survey, Feb., 1926) states that while **thyroid** and **whole gland pituitary** reduce weight without entailing the disadvantages of thyroid alone, when these agents are given in doses gradually increased at fortnightly intervals, starting with  $\frac{1}{2}$  grain (0.03 Gm.) of each per day and working up to a point where the patient loses 1 or 2 pounds a week, they prove more permanently effective. The dosage is controlled by estimations of the sugar tolerance at frequent intervals.

In a series of obese women, B. Gordon and von Stanley (Amer. Jour. Med. Sci., Jan., 1928) reduced the customary caloric intake to between 1100 and 1400 calories derived from protein fat at meal time. They gave in addition 100 to 150 calories between meals in the form of **dextrose candy**, usually during periods of exercise or

at times when symptoms of fatigue, hunger and weakness were experienced. A fairly constant loss of weight occurred, apparently without untoward effect or discomfort to the patients. It appears that weight loss to a considerable extent was due to moderate starvation at meal time, the dextrose being used principally to relieve symptoms and to supply energy during effort. The authors suggest that a disturbance in carbohydrate metabolism may be responsible for the storage of fat and for certain hypoglycemic-like symptoms occurring perhaps because of insufficient available glycogen.

**OCCULT BLOOD.**—The importance of recognizing the presence of occult blood in the stools is emphasized by Friedewald and Morrison (So. Med. Jour., May, 1927) in the diagnosis of simple ulcerative lesions and malignant disease of the gastrointestinal tract. Occult blood is usually noted in peptic ulcer, especially if frequent examinations are made, and as a rule at the time of the exacerbation of the symptoms, disappearing when these abate. The healing of an ulcer is indicated by a diminution in, and final absence of, occult blood in the stools. Occult blood is not always observed in the stools in intestinal cancer in its early stages. It occurs, however, as soon as ulceration takes place, and then persists throughout the course of the disease.

**ORCHITIS.**—Two cases of purulent orchitis of *gonorrheal* origin were observed by Salutzky (Arch. f. Derm. u. Syph., May 22, 1926). The organism was cultured in 1 case, but in the other, conditions were unfavorable, though microscopic examination of the pus was convincing. The testicle is rarely invaded by the gonococcus, having a strong protection in the tunica albuginea. Spermine is also believed to have the property of re-

ducing the toxicity of microbic poisons. He refers to 18 other cases reported in the literature, but in only 2 of these had the gonococcus actually been demonstrated.

Noguchi (Jour. of Exp. Med., Feb., 1928) identified an organism which, in the testes of normal rats, caused an acute orchitis such as resulted from inoculation of the blood or liver suspensions of splenectomized rats. In morphologic features the cultural forms of the microorganism isolated resemble *B. muris*. The organism found in the testicular tissues, however, is considerably coarser than *B. muris* and takes a deeper stain.

#### OTITIS MEDIA.—DIAGNOSIS.

—To confirm a diagnosis of otitis media associated with *pulmonary tuberculosis*, N. Michelson and M. M. Weiss (Amer. Jour. Med. Sci., Feb., 1927) seek for râles originating in the tuberculous lung. When such are detected by the examiner orally, they are also heard by the diseased ear. When the oral auscultation is negative, no râles are heard by the patient. This method serves to differentiate otitis media from acoustic nerve involvement.

**TREATMENT.**—Cramb (Jour. of State Med., June, 1927) resorts to an ionization treatment in *discharging ears*. He employs a solution of **zinc sulphate**—5 Gm. (1¼ drams) of the salt in 1000 c.c. (1 quart) water—and in order to prevent osmotic changes between the solution and the contents of the tissue cells, a non-electrolytic substance, **glycerin**, is added (57.6 c.c.—1.9 ounces), thus rendering the solution isotonic with the tissues.

In 37 cases of *chronic* suppurative otitis media in children, which had defied local treatment, 31 **radical operations** were performed by Gil-

hespy (Jour. of Laryng. and Otol., Aug., 1927), with resulting dry ears in 22 cases. In 2 cases a conservative **mastoid operation** was performed successfully, and in 3 cases a **Schwartz operation** was done, resulting in only 1 dry ear.

Alvez (Med. Contemp., June 20, 1926) advocates **vaccine therapy** in otitis media. In 5 cases he found it of great advantage for supplementing the ordinary treatments. If an **autogenous vaccine** is impracticable, the stock vaccine should be sensitized. After a mastoid operation, an old filtered broth culture may be applied locally, refraining from antiseptics.

After a study of 25 patients with chronic otitis media treated with local **ultra-violet irradiation**, Lussmann and Bendove (Arch. of Otolaryng., Aug., 1927) conclude that the beneficial effect is derived just as much from the **solar rays** as from the quartz and mercury vapor lamp, but the modes of application of these methods differ somewhat, because of the different concentration in the rays. Only 6 patients failed to improve. All others showed marked improvement, and in 7 a functional restoration of the ear was obtained.

H. Sternberg and K. Goldberger (Wein. klin. Woch., May 20, 1926) inject subcutaneously 1 c.c. (16 minims) of a 5 per cent. solution of **sodium iodide**, containing traces of free iodine, in patients with *acute* catarrh of the middle ear. They noted improvement within 24 hours and recovery within 6 days in 5 out of 10 patients.

#### Ovary.—THERAPEUTICS.—

In an editorial article (Jour. Amer. Med. Assoc., Oct. 20, 1928), the writer recalls that fresh whole ovaries, dried and defatted ovarian substances, and various fractions

isolated from the ovaries of lower animals, have been administered, mainly by the mouth. Summing up these extensive clinical tests, he quotes Novak's statement of 1924 (*ibid.*, Dec. 20, 1924) that "the results are rarely striking and often *nil* to the level-headed observer. It cannot be assumed that a commercial extract can replace the normal ovarian secretion in the patient's body, or, for that matter, that it originally contains any of the active hormones of the ovary. Here lies the crux of the whole problem, whose solution will depend in large measure on the work of the biochemist."

As regards the work on the "follicular ovarian hormone," stated to stimulate uterine growth and to evoke estrus or heat in various kinds of spayed animals, the writer also states that in patients this follicular hormone has not been encouraging in definite results. Laqueur (Jour. Amer. Med. Assoc., Oct. 20, 1928), however, appears to have succeeded in obtaining a water-soluble hormone from the ovaries termed by him and his collaborators "ovarial hormone folliculin menformen," found to produce mammary and vaginal changes similar to those produced by the follicular hormone previously referred to. It was obtained also not only from the ovaries and urine of women and the lower animals, but likewise from the testes and urine of normal men. Its specificity as an ovarian product is, of course, compromised. Yet, the similarity between the reactions of gonadal products in the 2 sexes has been previously observed, and at the present writing estimates could only be purely conjectural, and the actual value of the product can be established only by future study and observations. On the whole, the study of ovarian therapeutics is still *sub judice*.

**OZENA.**—The pathogenic agent of this distressing disorder is thought to be the paradiphtheria bacillus, discovered by Belfanti and Della Vendova in 1896. It is constantly found in the nasal secretions of these patients. It resembles the true diphtheria bacillus in every way, except that it is lacking in virulence for the

guinea-pig. Patients suffering from ozena may be treated, according to P. Harvier (Paris méd., July 9, 1927), by intramuscular injections of **diphtheria anatoxin**, the dose for the 1st day being 0.5 c.c. Two days later an injection of 2 c.c. may be given. The 3d and later injections of 4 c.c. are given twice a week for 2 months. After a rest period of a month, another series may be given.

According to Calogero (Rassegna

intern. di clin. e terap., Aug., 1927), **chaulmoogra oil**, tried in a few ozena patients, when applied locally with petrolatum every other day, seemed to yield satisfactory results. In some cases injections were also administered.

Casteran (Rev. med. Latino-Amer., Dec., 1925) observed that all the symptoms subsided in 10 cases of ozena in which **radium** had been applied to the nasal fossa. In 1 case the disorder had existed 10 years.

## P

**PAIN.**—Local anesthesia is resorted to by Roch and Frommel (Presse méd., Mar. 26, 1927) in the treatment of pains due to diseases of the viscera or serous membranes. They inject 10 c.c. (160 minims) of a 0.5 per cent. solution of **procaine hydrochloride** subcutaneously in the region where the pain is most severe. They used this method with good results in 18 patients with *angina pectoris*, *acute pericarditis*, *pleuritis*, *cholecystitis*, *biliary colic*, *gastric ulcer*, *cancer of the stomach*, and *splanchnoptosis with lumbar pain*. Violent pains were relieved for several hours, sometimes permanently. The treatment also brings about relaxation of muscles, which facilitates palpation.

The intensity of a **hot application** may be greatly increased, according to J. H. Kellogg (Arch. of Phys. Therap., Sept., 1927), by combining with it some means of simultaneously cooling the skin surface. Either an arc light, the incandescent lamp, or a heating element may be used. A small electric fan will supply the air current. With such a current falling on the heated surface, the intensity of

the light application may be doubled. Quantities of heat may thus be applied to which the skin would otherwise be absolutely intolerant and which would produce structural injury if long continued, and this without the slightest injury to the tissues or interference with the passage of the penetrating heat rays to the deeper structures.

Peet (Arch. of Surg., Aug., 1926) deems **section of the anterolateral tracts** a justifiable operation to relieve intractable pain. In *malignant disease*, it is comparable to the more common palliative operations, such as gastroenterostomy in carcinoma of the stomach. Rhizotomy alone has not given satisfactory relief.

Leriche (Presse méd., Apr. 20, 1927), discussing the anatomic and physiologic factors of pain, notes that it is frequently difficult to establish the exact location of pain. Hence, removal of ganglia may be without effect; furthermore, it is not yet known how detrimental the operation is. He warns against posterior radicotomy. Relief of pain is not always secured. He is also opposed to cordotomy,



although the operation was introduced into France by himself.

**PANCREATITIS.—DIAGNOSIS.**—Increase in the average diameter of the *erythrocytes* was noted by Holler and Kulka (Wien. klin. Woch., June 30, 1927) in all cases of chronic interstitial pancreatitis. Most patients with duodenal ulcers who had some clinical evidences of an involvement of the pancreas also showed macrocytosis, with a slightly elevated color-index.

Owing to the great differences of opinion concerning the occurrence of disturbed *gastric secretion* in cases of chronic pancreatic disease, Miyagi (Arch. f. klin. Chir., cxcix, 194, 1927) studied 57 patients in whom microscopic examination revealed disease of the pancreas. He found that in 82 per cent. of the cases there was a diminution or absence of free hydrochloric acid in the gastric secretions.

**TREATMENT.**—A study of 4 cases of acute and 15 of chronic pancreatitis by Cullen and Friedenwald (Arch. of Surg., July, 1927) showed that, in the prophylactic treatment of this condition, attention must be especially directed to the early removal of gall-stones, before complications have occurred. As preventive measures, a carefully regulated diet should be followed, together with **non-surgical biliary drainage** to avoid or overcome infection of the biliary tract and prevent the onset or progress of this serious disorder. When the disease is definitely established, immediate operation is advised. If gall-stones or pancreatic stones are present, they should be removed and infection overcome. It is important to secure effective drainage of the biliary passages by

means of **cholecystostomy, cholecyst-enterostomy** or **gastrocholecystostomy**.

In Schmieden's (Arch. f. klin. Chir., Oct. 26, 1927) opinion, early *operation*, as well as operation when in doubt, is indicated. The mortality in non-surgically treated cases is 95 per cent. Shock should never be considered a contraindication to operation. The best approach to the gland is a transperitoneal one, through a slit in the gastro-colic ligament. In all cases, the peritoneal covering and the capsule proper should be divided. Areas of softening are invaded with the finger.

In 3 cases of acute pancreatitis, in all of which the patients recovered, R. G. Henderson (Brit. Med. Jour., June 18, 1927) opened the glandular tissue freely so as to drain the whole organ efficiently.

**PARALYSIS FACIAL.**—In a typical case of paralysis of the facial nerve (Bell's palsy), examination by F. D. Knox and V. L. Minehart (U. S. Vet. Bur. Med. Bull., Aug., 1926) revealed a rather marked pyorrhea alveolaris and an impacted lower left 3d molar. Three **teeth** were **removed**. Within 2 days the facial paralysis disappeared to a very marked extent, but the right side seemed weaker than the left and pain was experienced at times in the 7th nerve at or near its exit from the skull. One week later the right upper lateral incisor was removed because of extensive and deep infected pyorrhea pockets about it. Within 4 days complete function had returned and the pain likewise.

Dabney (Amer. Jour. Med. Sci., April, 1925) is convinced that every

case of Bell's paralysis will be found to be of *toxic origin*, if care is exercised in the search for such a cause. Most cases show either tongue or ear symptoms, or both, associated with the facial distortion; in other words, the neuritis is intracranial, where cold cannot strike, but where infection can easily do so. On the other hand, exposure to cold where a patient is overheated can readily be the exciting cause of an acute exacerbation of a chronic trouble in the tonsils, teeth or nasal sinuses, and thus bring on a toxic neuritis of the facial nerve. In fact, he was able to demonstrate a definite causal relationship between each of these foci and a Bell's paralysis in 4 cases. He has never seen a case where he was not able to find an infectious cause. He has also been struck with the invariable presence of the *nervous diathesis* in every case seen. The 1st of the 4 cases proved to be an acute empyema of the left antrum and acute exacerbation of a chronic tonsillitis. **Irrigation** of the **antrum** and swabbing of the tonsils with **silver nitrate** resulted in marked amelioration of all the paralytic symptoms in 36 hours and then complete disappearance in 10 days. The second case had buried tonsils with surface plaques of caseous material and palpable glands at the angle of both jaws. His **tonsils** were **removed** under novocaine-adrenalin infiltration, and 2 days the eye was closed easily and normally; in 2 weeks there were no signs of any paralysis. In the 3d case, **removal** of an upper **bicuspid** with a large apical abscess resulted in an apparently permanent cure of the paralytic signs. The 4th patient had had toothache for 10 days. An X-ray picture showing some trouble

at the root of an upper **molar**, its immediate **extraction** was followed in 2 days by relief of the eye symptoms, and in 10 days of the whole paralysis.

Treatment of facial paralysis as a *sequel of otitis* is directed to the ear by Welton (Med. Jour. and Rec., May 5, 1926), if there is absence of mastoid signs, by promoting free drainage by **incision**, if the drum be intact or only a small opening present. If paralysis persists in spite of free drainage, **electricity** and **massage** should be employed. Paralysis of the facial can resolve without mastoid operation, Jones having reported a case of facial paralysis in acute otitis in which recovery took place in 25 days by treatment of middle ear conditions alone. Paralysis of the facial nerve is a cardinal indication for operation if the mastoid bone is involved. The author witnessed quick recovery in 1 case following **drainage of an antrum** and in another following **removal of infected tonsils**. He believes that verification by ample clinical evidence will in future be made of the assumption that facial paralysis of the Bell's palsy type is a simple neuritis, infectious in origin in every case.

Alfred Brown (Surg., Gyn. and Obst., May, 1926) has reported the results of **hypoglossofacial anastomosis** for facial paralysis in 2 cases. The hypoglossal nerve can be brought up to the facial with least tension by passing it in front of the digastric. In both cases the descendens hypoglossi was divided, and its central end sutured to the peripheral end of the divided hypoglossal. The paralysis of the tongue was not a particularly serious matter.

The operation itself is only the beginning of the treatment, and this

fact must be impressed on the patient in such a way so as to avoid any subsequent disappointment that results are slow in showing themselves. **Massage of the facial muscles** is instituted once a day, beginning 10 days after operation, and a small **faradic battery** is used twice a day, 1 electrode being held in the hand and the other placed just below the lobe of the ear. In about 60 days the face "feels different" and "seems to be more alive." A little later a twitch is felt in the muscles in front of the ear when the current is turned on. In 90 days this twitch can be brought about voluntarily by moving the tongue from side to side in the mouth and pressing it against the lingual surface of the teeth. From then on the patient should practice **facial movements** in front of a mirror, always keeping within the limit of muscle fatigue. When improvement ceases cannot as yet be told. The 1st patient wrote, 19 months after operation, that she was still improving. Judging by these 2 cases, this operation will not only restore facial symmetry and voluntary motion to the facial muscles, but also bring about the return of a certain amount of emotional expression.

**PARALYSIS, GENERAL.—TREATMENT.**—In the **malaria treatment** of this disease in 120 patients successfully inoculated, as reviewed by Ferraro and Fong (Jour. of Nerv. and Ment. Dis., Mar., 1927), 20 patients died, 6 of these from acute malaria. The total improvement amounted to 61.45 per cent. Only 3 cases of 34 of the demented type of paresis showed very good remissions, while 7 were improved, 3 slightly im-

proved, and 21 remained stationary. The highest percentage of the unimproved cases was in the demented type, which represented 52.5 per cent. of the unimproved cases and 55.44 per cent. of the whole group of demented cases.

Of 156 male patients with general paralysis treated by H. A. Bunker, Jr., and G. H. Kirby (Med. Jour. and Rec., Feb. 15, 1928) with **malaria**, 50 per cent. manifested a definitely favorable response, even though in  $\frac{1}{3}$  of the latter residual evidences of previous cerebral tissue destruction precluded full recovery in a clinical sense. In this group, observed over an average period of  $2\frac{1}{2}$  years, the death rate from general paralysis was 12.5 per cent.

Among 39 patients inoculated by A. Rabinovitch (U. S. Vet. Bur. Med. Bull., Jan., 1927) with benign tertian **malaria**, improvement occurred in 59 per cent. Bosch and Mó (Semana méd., Jan. 7, 1926) obtained results surpassing anything previously realized. Of their 40 patients thus treated, 17.64 per cent. have been attending to business for up to 2 years to date; 29.41 per cent. have returned to ordinary home life, and only 20.58 per cent. failed to show benefit. In 1 case with advanced cachexia death occurred, while another patient died after an operation for appendicitis. The others are still under treatment.

Pacheco e Silva (Brasil-méd., Mar. 12, 1927) studied the brains of 56 patients with general paralysis, 3 of whom had been inoculated with malaria. He found that the spirochetes do not enter the nerve cells. On the contrary, these act as a barrier. After some cells have been destroyed the organisms migrate elsewhere. They accumulate

around capillaries and small vessels, crossing from these to the nervous structures. Spirochetes prefer bifurcation points for crossing, as it seems easier to break through there. They were especially abundant in the 2d and 3d layers of the pyramidal cells at the level of the frontal lobe. They were rarely found in the centrum ovale or at the level of the meninges, and never around meningeal vessels. They were detected in the lenticular nucleus and in all the cortical regions, but not so often as in the frontal region. It was difficult to discover any in the cerebellum, even when the lesions were conspicuous.

**PARATHYROID.**—Hammett (Amer. Jour. of Physiol., July, 1927), judging from the sequence of events and other phenomena exhibited in parathyroid deficiency (*hypoparathyroidism*), concludes that the parathyroid glands subserve 2 functions, that of participation in the regulation of the calcium balance, and that of the prevention of the accumulation of toxic tetany producing compounds within the organism. A possible seasonal difference in sensitivity to parathyroid deficiency is indicated.

The influence of *solar radiations* on the parathyroids was studied by G. M. Higgins and S. Sheard (Science, May 25, 1928). Hyperplasia of the parathyroids is known to occur in animals kept on a diet deficient in calcium; since calcium metabolism is dependent on vitamine D and upon the lesser wave lengths of sunlight, the authors tried to determine experimentally the effect of varying wave-lengths on the parathyroid glands of chicks maintained upon a diet with an adequate calcium content. After 3 weeks, a differential growth was noted: The glands of those chicks grown under blue and amber

glass on a diet lacking cod-liver oil were hyperplastic. The glands of those chicks kept under these filters and fed the oil were smaller than those of the chicks who did not receive the oil, but were larger than those of the chicks grown in the compartments screened with vitaglass or ordinary window glass. Indeed, chickens taken from the compartments screened with blue or amber filters and maintained on a diet without the oil had, at the end of 1 month, parathyroids 9 times as large as those of the chicks grown under vitaglass on the same diet. The authors conclude, therefore, that normal development of the parathyroids will be best maintained in the presence of both the lesser and the greater wave-lengths of sunlight.

Brannon and Dragstedt (Jour. of Lab. and Clin. Med., May, 1928) found experimentally that *parathyroid tetany* could be relieved or controlled, without causing any material change in the level of the blood calcium, by the administration of **barbital**. The life of parathyroidectomized dogs could be slightly prolonged by this agent.

W. S. McCann (Jour. Amer. Med. Assoc., Jan. 28, 1928) observed that in certain edematous patients the parathyroid principle causes diuresis, and refers to 3 cases of **generalized edema** caused by a severe renal disorder which were greatly benefited by the transient elevation of the blood serum calcium which followed the injection of parathyroid. The diuresis of water and salt lasted several days.

**PELLAGRA.**—J. Goldberger and G. A. Wheeler (Pub. Health Rep., May 13, 1927), of the Public Health



Service, found that **tomatoes** are effective as pellagra preventives, while both carrots and rutabagas seem to lack this property. They recommend the use of tomatoes in the treatment of active cases, in which they may be administered in the fresh, raw state, in the form of the juice, or as a soup. The daily quantity should be as liberal as is permitted by the digestive condition of the patient. A liter (1 quart) a day of the juice is not too much. In endemic localities a more liberal use of tomatoes than now obtains, particularly during the late winter and spring, may well be encouraged as a measure tending to the prevention of the disease.

**PERICARDITIS.**—According to C. S. Williamson and H. N. Ets (Arch. of Int. Med., Aug., 1926), a number of patients with substantially uncomplicated pericarditis with *effusion* die as result of the pressure of the exudate shutting off mechanically the great veins. The pressure in the pericardial sac, the real danger, is not proportional to the size of the exudate, but rather to the rapidity with which the effusion develops. A steady fall in the arterial pressure, and particularly a sudden increase in the rate of fall, is a direct indication for therapeutic **puncture** and relief of the pressure.

Extrapericardial stenosis of the inferior vena cava, between the pericardium and the diaphragm, was attended, in Rohde's (Deut. Zeit. f. Chir., May, 1927) experiments on dogs, by many of the symptoms of adhesive pericarditis. An initial fall in arterial pressure, explained by diminution of the output of the heart, was followed after a few weeks by a rise.

Poll (Amer. Heart Jour., Feb. 1927) has observed a patient over 3 years,

during which he has had 7 attacks of undoubted pericarditis, of short duration, afebrile in character and of unknown etiology. A search of the literature has failed to reveal any similar case.

An interesting case of *tuberculous pericarditis* as sole tuberculous lesion was observed by Alston (Edinburgh Med. Jour., Mar., 1928) in an old man, aged 70, of fine physique, in whose body no other gross tuberculous lesion could be discovered. He gave a history of unusually good health, and stated that he had not had any illnesses previous to an attack of influenza about 2 months before his admission to the hospital. Positive evidence of the time and route of infection was absent, but the view that the pericarditis was due to a secondary blood-spread infection from a small lesion, not discovered at autopsy, is considered the most likely explanation. No evidence was found pathologically of a cause predisposing the pericardium, in particular, to infection by tubercle bacilli.

When a *purulent effusion* occurs in the pericardium, N. Winslow and A. M. Shipley (Arch. of Surg., Sept., 1927) recommends **pericardiectomy**, on the basis of 10 patients treated by them. Of these 10 cases, 6 were cured, while 4 terminated fatally.

Youmans (Ann. of Clin. Med., June, 1926) observed 2 cases of *calcification of the pericardium* diagnosed during life. In both, the disease was tuberculous in origin. Operation (**pericardiectomy**) was performed in 1 case, with apparent benefit.

Yacoël and R. Giroux (Arch. des mal. du cœur, Mar., 1926) report a case of *tuberculous pericarditis* with effusion in a man, aged 45. **Puncture**, releasing 350 c.c. of fluid, did not prevent reappearance of the effusion in a few days. Then 600 c.c. of fluid was removed, the tapping this time being

followed by injection of 300 c.c. of nitrogen. The relief was immediate. The procedure was repeated a month later. Artificial pneumopericardium should be preferred to pericardiotomy, which does not prevent the formation of pericardial adhesions. The latter procedure is indicated only in acute purulent pericarditis and tuberculous abscess of the pericardium.

#### PERITONITIS.—DIAGNOSIS.

—An early sign of acute peritonitis is contributed by Moppert (Schweiz. med. Woch., Apr. 24, 1926). This consists of fluoroscopic observation of the presence of gas bubbles in the right hypochondrium close to the diaphragm. Immediate intervention saved both patients in which this observation was made.

H. Neuhof and I. Cohen (Ann. of Surg., Apr., 1926) state that an exploratory abdominal puncture is simple, safe, and a valuable aid in the diagnosis of obscure acute intra-abdominal disease. It serves to establish the diagnosis of a traumatic or inflammatory intraperitoneal lesion in some cases in which the diagnosis can not otherwise be made. In other instances, puncture offers conclusive information as to the source and nature of a peritonitis, and thus aids directly in arriving at the therapeutic indication, as well as the prognosis.

**TREATMENT.**—Resorting to the ether treatment in perforative peritonitis, Schleussner (Münch. med. Woch., July 1, 1927) had a mortality of only 11.2 per cent., as against 24.2 per cent. before he began using it. G. Wolfsohn's (Arch. f. klin. Chir., June 10, 1926) technic, based on clinical observations and animal experiments, and which had no bad effects, is at

present as follows: At the close of the laparotomy, the abdominal cavity is washed out with salt solution, then, the ether anesthetic being stopped and the pelvis lowered to the horizontal position, the abdominal wound is held wide open and 30 to 50 c.c. (1 to 1½ ounces) of ether poured in. After waiting about 1 minute for the superfluous ether to evaporate, the cavity is again washed out with 100 c.c. (3½ ounces) of salt solution. The abdomen is then closed with or without drainage. He holds that the fatalities reported from adhesion ileus, shock and the toxic effects of the ether occurred chiefly because too much ether was used, or because the superfluous ether was not allowed to evaporate before the cavity was closed. The ether should always be poured into the cavity through the wide-open abdominal wound, never through a funnel after partial closure of the wound. The writer does not advocate the prophylactic use of ether.

In acute diffuse peritonitis, Valerio (Brazil-méd., April. 24, 1926) operates at once; an occasional unnecessary laparotomy is much better than to let even 1 case get beyond control. The old death-rate of 80 to 95 per cent. has been reduced in the last 15 years to 10 to 20 per cent. The main feature is to discover and remove the cause, irrigating and draining the peritoneum. He warns against draining in gastrointestinal operations, as this is liable to entail interminable fistulas. In appendicitis and adnexitis, he drains Douglas's pouch as a routine measure. Fowler's position should be enforced in every case of peritonitis. An abundant supply of a solution of saccharose or glucose should be provided, avoiding physio-

logic salt solution, as this blocks the kidneys. **Camphorated oil** is also useful, 10 c.c. ( $2\frac{1}{2}$  drams) daily, given cautiously. **Autohemotherapy** and **antitetanus serum** should also be considered. In post-operative dilatation of the stomach, the stomach should be rinsed out, never using more than 200 or 300 c.c. ( $6\frac{2}{3}$  to 10 ounces) for the purpose.

In a review of the treatment of late cases of general peritonitis originating in the appendix in the Greifswald University clinic since 1903, Reschke (Arch. f. klin. Chir., Dec. 29, 1926) states that of 65 patients brought in on the 4th day or later, 50 were operated on, with a mortality of 92 per cent., and 15 were treated conservatively, with a mortality of 53 per cent. Among patients brought in on the 3d day, the mortality was more nearly equal, 48 and 50 per cent., respectively. So far as could be judged the process had extended over the entire abdominal cavity in all delayed cases, brought to the Greifswald clinic.

In animals, Buchbinder (Surg., Gyn. and Obst., Dec., 1927) found that **hypertonic dextrose solution** prevents fibrin formation in a sterile peritonitis of moderate grade. The patency of a drain within the peritoneum can thus be maintained for several days and adhesions between inflamed loops of bowel prevented. The method is devoid of danger if dehydration is prevented.

Pereira (Repert. de med. y cir., Aug.-Sept., 1927), of 3 patients with general peritonitis due to *intestinal perforation*, operated on 2 of them under **spinal anesthesia**. Both recovered. The other patient, on whom chloroform anesthesia was used, died from peritonitis after operation. One

of the patients who survived had 7 perforations of the intestine.

**TUBERCULOUS PERITONITIS.**—According to Schwarzenberg and Steeger (Arch. Latino-Amer. de ped., Apr., 1926), the prognosis is more favorable when the co-existing pleural or tracheobronchial processes are of a mild type than when there are signs of a cheesy pulmonary process. The tuberculin test is useful. Ordinarily **laparotomy** is resorted to only in the cases with ascites, but this is the type of case which tends naturally to spontaneous recovery even without the operation.

Duguet and Clavelin (Jour. des prat., Apr. 24, 1926) used the **ultra-violet rays** in 8 patients with persisting tuberculous peritonitis of 2 to 6 months' standing and rebellious to medical or surgical treatment. A clinical cure occurred in 7 cases; 1 patient died. A mercury quartz lamp of 1500 candle power was placed at 1 meter distance, the first exposure lasting 5 minutes. The sittings were gradually lengthened to 1 hour, and the distance reduced. The treatment consisted of at least 20 exposures to the rays.

In 19 cases of exudative tuberculous peritonitis treated by Lucherini (Policlin., Sept. 5, 1927) with **gas insufflation**, the result was excellent from the 1st injection. In only 2 cases was a repetition of the procedure necessary. The cure is, of course, clinical, not anatomic, and the patients must be selected carefully. Most of those treated were still in good condition after 9 to 10 months. The volume of gas injected must be  $\frac{1}{2}$  the amount of fluid removed. **Air** seems to be the best gas for the purpose.

**PERTUSSIS.**—In a study of the *lungs* from 225 cases of fatal pertussis, Feyrter (Frankf. Zeit. f. Pathol., xxxv, 213, 1927) found that the lung becomes affected early in the course of the disease, and that the bronchial tree is involved permanently. Endobronchitis, endobronchiolitis, peribronchitis, peribronchiolitis, bronchiolitis fibrinosa and obliterans, ectasias, and stenoses were all represented. The peribronchitis explains the long duration of the pulmonary affections of whooping-cough, the frequent exacerbations, and the peculiar nature of the lung sounds. In 32 cases he found evidences of tuberculosis.

In necropsies of fatal cases of pertussis, L. W. Smith (Arch. of Path. and Lab. Med., Nov., 1927), found, among other changes, bronchiectasis, fibrosis, and even a pseudometaplasia of the bronchial epithelium from the columnar to the squamous type.

**TREATMENT.**—W. D. Anderson and Homan (Amer. Jour. Med. Sci., Dec., 1927) tried **ephedrine hydrochloride** in 20 cases of pertussis. It was administered orally in a watery solution,  $\frac{1}{4}$  grain (0.016 Gm.) being given to children over 1 year of age and  $\frac{1}{8}$  grain (0.008 Gm.) to those younger. In 6 cases, medication was given at bedtime only; in the others, night and morning, and occasionally 3 times a day. No other medication was used. Relief from spasmodic cough and vomiting was obtained in 18 cases. In all patients in whom improvement was noted, some cough remained, but it was mild and of a type associated with acute upper respiratory infection, none of the characteristic signs of whooping-cough remaining. Complications did not occur in these cases. The drug

appeared most useful during the 2d stage. Smaller doses would give relief without toxic symptoms which, though not severe, were observed. In 6 of 9 well children ephedrine caused a slight rise of blood-pressure.

A comparative test was conducted by Blasi (Policlin., Aug. 22, 1927) in 52 cases of pertussis treated with **vaccine** and 250 by ordinary methods. Patients treated with vaccine, 4 to 8 injections, recovered relatively soon—8 to 16 days, while in the others the disease lasted 3 to 5 months.

Mishulow, Oldenbusch and Scholl (Jour. of Inf. Dis., Aug., 1927) found that even  $5\frac{1}{2}$  years failed to cause deterioration of pertussis vaccines when freshly prepared and after storing. Eight different preparations, stored at 8° to 10° C. (46.4° to 50° F.) and tested periodically, were highly potent at the end of  $4\frac{1}{2}$  years.

Grinnan (Va. Med. Mthly., May, 1927) found that ordinary **smallpox vaccine**, used for vaccination in all cases of pertussis which had not been vaccinated, as soon as the coughing paroxysms occurred or later, acted more effectively the earlier it was used. In many cases, as soon as the pustule was formed, there was an immediate cure. The suffocation was relieved, the vomiting stopped, and the whoop was no longer noticed.

The successful prevention of measles by the use of convalescent serum suggested to H. P. Wright (Can. Med. Assoc. Jour., July, 1927) that a similar type of treatment might be applicable in whooping-cough. The method was tried with success in 3 cases. From 8 to 10 c.c. of a **parent's blood** was injected subcutaneously.

Hrabovszky (Strahlenther., xxvi, 706, 1927) found **X-ray** treatment



very efficient, especially when the irradiation was over the liver instead of, as ordinarily applied, over the hilus.

Pinós and Pujadas (Rev. med. de Barcelona, May, 1926) attribute the prompt benefit from **X-ray** exposures in pertussis to the rapid transformation of lymphoid tissue into cicatricial tissue. The hypertrophied tracheo-bronchial glands rapidly subsided to normal size. According to Suzuki and Kawashima (Orient. Jour. of Dis. of Inf., Jan., 1928), the **X-rays** reduce the number of lymphocytes and the number of bacilli in the sputum.

**PHLEBITIS.**—Schwartz and Schil (Paris méd., June 18, 1927) found, in 30 cases of operated uterine fibroma, inflammation of the intima of the *uterine veins* in 66 per cent. The lesion was present in 16 per cent. of 23 cases of other gynecologic diseases. Phlebitis occurred after operation in 3 cases of fibroma and in 1 case of uterine sclerosis. Endophlebitis is regarded as the predisposing cause, and the presence of bacilli as the predominant factor, in phlebitis.

In a series of 87 cases of *post-operative phlebitis* studied by G. E. Brown (Arch. of Surg., Aug., 1927), the most characteristic diagnostic sign was a localized tenderness of the affected vein. The presence of edema is equivocal. Pulmonary infarction was a frequent complication, but no instance of fatal pulmonary embolism was encountered.

**TREATMENT.**—The surgical measures advocated by T. Thompson (Lancet, Dec. 17, 1927) are as follows: The **infective focus** must be **drained** or **removed**—*e.g.*, the mastoid

process must be drained or the appendix removed. Whenever possible a **ligature** must be placed on the vein between the affected area and the heart—*e.g.*, the jugular vein must be ligatured at the root of the neck in cases of lateral sinus thrombosis. When this has been done, the inflamed vein should be thoroughly **laid open**, the **septic clot removed**, and the cavity thoroughly **cleansed** and **drained** whenever anatomic conditions allow of this being done. The patient's strength must be maintained by careful **feeding**; **alcohol** and other **stimulants** should be given when needed, while **antistreptococcal serum** may be given to combat any toxemia.

**PINEAL BODY.**—The importance of lateral displacement of the shadow of this organ, especially when associated with characteristic signs and symptoms, is emphasized by O. B. Spalding (U. S. Nav. Med. Bull., Apr., 1928), who summarizes the recent study of approximately 350 skull films by Vastine and Kinney (Amer. Jour. of Roentg., Mar., 1927), 200 of which showed calcification of the pineal. The author reports 2 cases observed by himself in which displacement of the pineal, revealed by X-ray, was caused by a brain abscess in the one and a meningioma in the other, as shown at the autopsies. In their series of cases Vastine and Kinney had found the pineal gland displaced in 51 per cent. of the patients with gliomas and 57 per cent. of those with meningiomas. As to the other causes of displacement of the pineal, Vastine and Kinney had observed it in 13 per cent. of the cases of hydrocephalus; in 10 per cent. of pituitary

adenomas, and in 2 cases of intracranial hemorrhage. The diagnostic value of the measure can readily be surmised.

**PITUITARY BODY.**—In the preceding issue of the SUPPLEMENT we reviewed the various labors which had in a measure weakened the secretory functions attributed to the pituitary and seemed to relegate the phenomena attributed to this organ to the hypothalamic region, notably the tuber cinereum. Lissner (Cal. and West. Med., Apr., 1927), in reviewing the situation, remarks, however, that "the pituitary has not entirely lost its place as an endocrin organ," thus agreeing indirectly with Sajous, who, as far back as 1903, urged that the pituitary and the tuber cinereum were functionally united as factors in the production of the experimental phenomena and clinical observations associated with the pituitary. Lissner quotes, as follows, the various recent works which have favored the pituitary secretion theory: "Abel isolated a tartrate from the pars posterior and pars intermedia, not yet of entire chemical purity, but of extraordinary potency, being 1200 times as powerful as the acid phosphate of histamine, heretofore the strongest smooth-muscle stimulant known. Abel and Geiling observed that the floor of the 3d ventricle in the immediate vicinity and inclusive of the tuber cinereum contains a blood-pressure-raising and oxytocic substance quite indistinguishable from that present in the posterior lobe of the hypophysis. In ablation of the hypophysis this accessory tissue cannot be removed; it could still perform the function of the posterior lobe and thus prevent a

diabetes insipidus. Abel (Johns Hopk. Hosp. Bull., Jan., 1926), therefore, is disinclined to accept the negative position of Camus and Roussy 'in regard to the function of hypophyseal tissue.'"

"Evans and coworkers prepared a fresh bovine anterior lobe fluid which had remarkable growth-inducing properties. Repeated injections of this fluid into normal rats produced gigantism, and a replacement therapy with this extract, in rats dwarfed by an early hypophysectomy, stimulated normal growth and repaired the pituitary deficiency."

"Smith (Jour. Amer. Med. Assoc., Jan. 15, 1927) found that 2 concomitant operations, pituitary ablation and injury of the tuber cinereum, produced 2 distinct and characteristic syndromes. That the hypophysectomy syndrome consisted chiefly of: an almost complete inhibition in growth in the young animal, and a progressive loss of weight (cachexia) in the adult; an atrophy of the genital system with loss of libido sexualis, and in the female an immediate cessation of the sex cycles; an atrophy of the thyroids, parathyroids, and suprarenal cortex; and a general physical impairment."

"Conversely, injury to the hypothalamus produced adiposity and genital atrophy, an experimental state corresponding to what is generally referred to, in the human, as Fröhlich's syndrome (dystrophia adiposogenitalis)."

As Lissner rightly states, "the end is not yet and a prepared open mind is the safest attitude." But it may be remarked in this connection, all the admirable work now being done is only accumulating evidence to the

effect that the pituitary and the hypothalamus constitute a functional unit.

The therapeutic uses of pituitary preparations are mentioned in the articles on various diseases and will not, therefore, be repeated here.

**PLACENTA PREVIA.**—The deaths from placenta previa, both maternal and fetal, seem more numerous than is generally believed. In a series of 165 cases analyzed by Brodhead and Langrock (Surg., Gyn. and Obst., Jan., 1927) there were 18 deaths, 3 of the women being moribund when admitted and 1 dying from tuberculosis and inanition. The gross maternal mortality was 10.9 per cent. Excluding the 4 cases mentioned above, 3 of which were hopeless from the start, the mortality was 8.7 per cent. Among 79 cases reviewed by Liebermann (Amer. Jour. of Obst. and Gyn., June, 1926), there were 11 maternal deaths and 51 fetal deaths. The greatest number of deaths (4 maternal and 15 fetal) followed version and breech extraction with cervical pack induction. The writer recommends bag induction as the preferable method.

**TREATMENT.**—On the basis of 66 cases, Ledoux (New Orl. Med. and Surg. Jour., Jan., 1927) urges the importance of early diagnosis and prompt treatment. All patients should be hospitalized and given general supportive treatment for hemorrhage and shock, and a **tight cervical** or **vaginal pack** if hemorrhage is repeated or severe or if transportation at a distance is required; finally, preparations should be made for **transfusion**. Immediate **abdominal section**, with the high fundal incision, is best in cases of

*central* and *cervical* placenta previa, provided the patient is afebrile and has not been subjected to injudicious examinations or manipulations, and the fetus is viable and at term. If the fetal death is recent, abdominal section should be considered. Most cases of *marginal* placenta previa are satisfactorily handled by **rupture of the membranes, packing or hydrostatic bags**; if hospital facilities are lacking or in cases of grave emergency, the pack, the bag, the **Braxton Hicks version** or **version without extraction** are indicated. **Cesarean section** is the ideal method of treatment because blood loss is avoided, trauma is minimized and the danger of infection diminished, with a resultant lessened maternal and fetal mortality.

Wuhrmann's statistics (Schweiz. med. Woch., May 8, 1926) based on 500 cases of routine use of the Gabastou method of **injection of a fluid** into the placenta revealed that it has many disadvantages over expectant treatment. The duration of the 3d stage of labor was delayed, while the amount of hemorrhage was increased. It should be applied only (1) as a routine procedure in women in whom the expulsion of the placenta in previous pregnancies had not proceeded normally, and (2) in retention of the placenta.

**PLAGUE.**—Observations during several epidemics in the French colonies in Africa by Léger (Paris méd., June 5, 1926) tended to show that during certain epidemics the rats did not harbor the plague bacilli. On the other hand, there was evidence that the disease was transmitted from man to man, through the intermediation of healthy carriers of the specific bacillus.

A material reduction in mortality

from an epidemic of plague prevalent in Nairobi in 1926 was obtained by J. A. Carman (Kenya and East Afr. Med. Jour., Oct., 1927) by means of injections of a solution consisting of weak **tincture of iodine**, B. P., 15 minims (0.9 c.c.), and **camphor** and **thymol**,  $7\frac{1}{2}$  grains (0.5 Gm.) of each, in 2 c.c. (32 minims) of water. The injection was made directly into the affected glands. If the temperature did not drop appreciably by the next day, another injection of  $\frac{1}{2}$  the dose was given; otherwise a full dose was administered on alternate days until recovery was assured.

**PLEURISY.**—According to Scheel (Norsk. Mag. f. Laeg., Nov.-Dec., 1927), over  $\frac{2}{3}$  of 956 cases analyzed occurred between the ages of 11 and 30, and  $\frac{1}{2}$  of all between the ages of 16 and 25. Of the 812 patients observed for 1 to 10 years, 22.4 per cent. developed tuberculosis, chiefly pulmonary, with a total mortality of 9.9 per cent.; the highest mortality occurred in the 1st 3 years.

**TREATMENT.**—Kirschenblatt and Nasarjan (Münch. med. Woch., Dec. 30, 1927) employed intrapleural injections of iodoform in 30 cases of exudative pleuritis. The results led them to conclude that this method is the speediest and best. In nearly all cases, and especially in the tuberculous, a severe febrile reaction appeared after the injection and lasted from 2 to 4 days. Absorption of the effusion followed. In no case did the serous effusion become purulent during treatment, while cloudy effusions always became clearer.

In the *acute suppurative pleurisy of children*, Bohrer (Amer. Jour. of Surg., Sept., 1927) recommends a high-

calory diet as essential in overcoming negative nitrogen balance. Repeated **aspiration** during the formative stage is advised to relieve suffering. **Intercostal incision and drainage** are advocated, only local anesthesia being used. A "flapper tube" aids materially in lung expansion. **Blood transfusions** are deemed of great value, and **exercises** for lung expansion are also of capital importance. Mieres (Semana méd., Jan. 5, 1928) urges **lavage** in purulent pleurisy following *artificial pneumothorax*. In 3 such cases, **irrigations with lime water** acted favorably owing to calcium increase.

**PNEUMONIA, LOBAR.—DIAGNOSIS.**—F. T. Billings (Amer. Jour. Med. Sci., June, 1926) studied the *cardiovascular apparatus* in 78 cases of lobar pneumonia and bronchopneumonia. Arrhythmia in 6 patients coincided with 2 deaths, the irregularity, in all but 1, being premature beats. Weak or feeble heart sounds occurred in 32 patients; 19 of these died. Only 3 cardiac murmurs were discovered. Of the 7 patients who developed pulmonary edema, all died. A clinical diagnosis of myocarditis was made in 29 patients, of whom 16 died. Myocardial insufficiency was diagnosed in 21 patients from graphic tracings, most of them being confirmed clinically. No cardiovascular disturbance could be discovered in 23. All of these recovered, except 5. Three cases came to necropsy. One showed cardiac muscle degeneration. Reduplication was recognized once, and gallop rhythm once. Cardiac enlargement was present in 12 cases, and in 6 was possibly due to right-sided dilatation. Apparently death



in pneumonia is, in the large majority of cases, due to cardiac failure.

Of 40 cases observed by J. P. C. Griffith (*ibid.*, Oct., 1927), 16 showed *displacement of the heart* to the affected side. He concludes that the cardiac displacement is dependent at least primarily on distention of the healthy lung.

Vignolo-Palombella (*Rif. med.*, Jan. 17, 1927) found an increase of *indican in the blood* in pneumonia, which soon returned to normal during the crisis, but slowly during lysis.

*Post-operative pneumonia* was found by Protopopoff (*Russk. Klin.*, Apr., 1926) in 4 per cent. of 2274 surgical cases, the death rate being 0.4 per cent. In 18, or 30 per cent., the pneumonia occurred after operations on the gastro-intestinal tract; after other kinds of laparotomies, in 12 per cent. Apart from abdominal section, post-operative pneumonia occurred in only 0.8 per cent. Intestinal peristalsis, as well as respiratory movements of the diaphragm and abdominal wall, may propel the emboli into the lung, thus explaining the frequency of post-operative pneumonia after laparotomies.

*Adhesions in the pleura* were found in 1408 out of 3041 necropsies (46.3 per cent.) by Koopmann (*Med. Klin.*, June 25, 1926). They were often tuberculous, except in primary lesions. Extensive adhesions of the lower lobes are usually due to pneumonia or other inflammatory processes. The unexpected deaths in pneumonia occurred, as a rule, in patients with adhesive pleurisy.

Verö (*ibid.*, Feb. 18, 1927) verifies the frequency, in pneumonia, of *redness of the cheek* of the affected side. This is especially evident or at least noticeable in children.

#### ETIOLOGY AND PATHOGENESIS.

—In 69 cases of lobar pneumonia and 34 of bronchopneumonia in children between the ages of 3 weeks and 11 years, Westlund (*Jour. of Inf. Dis.*, June, 1926) found *pneumococci* in nasopharyngeal swabbings in 60.8 per cent. of the cases of lobar pneumonia and in 52.6 per cent. of the cases of bronchopneumonia. In 48 non-respiratory diseases in children, pneumococci were found in 58 per cent. Type I was not represented in this group: Type II formed 14.2 per cent., Type III, 3.6 per cent., and Type IV, 82.1 per cent. The occurrence of Type II pneumococci in the throats of these children in the hospital wards may have been due to contact.

Cecil, Baldwin and Larsen (*Arch. of Int. Med.*, Sept., 1927), in 2000 cases of lobar pneumonia, found the following pathogenic organisms: *Pneumococcus*, 95.65 per cent.; *hemolytic streptococcus*, 3.8 per cent.; *Friedländer's bacillus*, 0.4 per cent.; *influenza bacillus*, 0.05 per cent., and *Staphylococcus aureus*, 0.1 per cent. The incidence of the various types of pneumococcus was: *Pneumococcus* Type I, 33.6 per cent.; Type II, 19.2 per cent.; Type III, 13.4 per cent.; Type IV, 33.1 per cent. There was considerable variation from year to year in the incidence of the various types. A study of the mode of termination in pneumococcic pneumonia in which the patients recovered showed that 49.6 per cent. terminated by crisis. In Type I infections, in which it was most frequent, crisis occurred in 56.6 per cent.; in Type II, in 50 per cent.; in Type III, in 39.3 per cent., and in Type IV, in 45.5 per cent. The death rates for the vari-

ous types (without specific treatment) were as follows: Type I, 20.7 per cent.; Type II, 42 per cent.; Type III, 41.6 per cent.; Type IV, 29.2 per cent. Types I and IV are the milder forms, Types II and III are the severer forms, of pneumococcic pneumonia.

Pneumococcus Type IV is chiefly concerned in the morbidity of pneumococcus infections in Pittsburgh. Of 2524 sputum examinations reported on by McMeans (Atlantic Med. Jour., May, 1927), 388 were Type I; 380 were Type II; 349 were Type III, and 1407 were Type IV.

Rosenau, Felton and Atwater (Amer. Jour. of Hyg., May, 1926) in observations made in the winter of 1923-1924, in Boston, regarding the distribution of pneumococci among healthy persons, intended to trace the transmission of the pneumococci between 1 case and the next, concluded that pneumococci occur in the throats of *carriers* without special relation to the age of the carrier.

Powell, Atwater and Felton (*ibid.*, July, 1926) found that pneumonia appears when there is a coincidence between infection with a pathogenic form of the pneumococcus and a lack of resistance in the same individual.

**PATHOLOGY.**—J. F. Gaskell (Lancet, Nov. 5, 1927) urges that the estimation of the virulence of the infecting organism in pneumonia is of the utmost importance. This can be measured in mice. Organisms whose titer is below 3 do not have any pathogenic value in the healthy host. Organisms of titer 4 produce bronchopneumonia lesions. Organisms of titers between 4 and 5 produce lobular lesions. Organisms of titers between 5 and 6 produce either (1)

lobar pneumonia or (2) general infection of the thoracic serous cavities. Organisms of titers between 6 and 7 produce either (1) lobar lesions, which become septicemic, or (2) the septicemic or miliary lesion. Lobar pneumonia in the healthy adult is due to organisms of titers between 5 and 7, which are otherwise comparatively rare. The disease is spread by direct contact, infection passing from throat to throat, though very possibly through the intermediate carriers.

The quantity of blood expelled by the *heart* in a given unit of time, as well as in a single beat, is considerably increased in rabbits suffering from pneumonia, according to Lee-gaard (Acta med. Scand., Feb. 28, 1927, Suppl. xvii). The respiratory consumption of oxygen is increased. The difference between the oxygen content in blood from the left and from the right side of the heart is less than normal. The increase in the respiratory consumption of oxygen and in the output of blood from the heart may be ascribed partly to the local process in the lungs, but is mainly a result of increased metabolism.

A. B. Hastings and Sendroy (Jour. of Exp. Med., June, 1927) found that estimation of the blood reaction and gases in a series of 19 pneumonia patients failed to reveal a condition of acidosis occurring at any time during the disease. Nassau and Pogorschelsky (Zeit. f. Kind., June 2, 1926), however, found in fatal cases of bronchopneumonia in infants an increased concentration of potassium, and especially a decrease of dextrose in the blood. The blood calcium was lower in some of the children.

The *leukocyte* variations in the circulating blood in 32 cases of lobar pneumonia, studied by Hickling (Arch. of Int. Med., Nov., 1927), showed that a monocytosis develops in the circulating blood of all patients except those who die early in

the disease. Evidence is given which shows that this monocytosis is closely associated with resolution of the affected lung.

**TREATMENT.**—The results of chemical analyses of the blood in 5 cases of lobar pneumonia recorded by Haden (Amer. Jour. Med. Sci., Dec., 1927) showed almost constantly a low chloride content. Often the urea nitrogen and non-protein nitrogen are high. The carbon dioxide combining power is seldom below normal. The urine shows very little chloride and usually a high nitrogen content. The use of **sodium chloride** in the cases reported had a marked therapeutic effect. The dose varied considerably, from 4 to 36 Gm. (1 to 9 drams) daily. Usually the salt was given in uncoated tablets by mouth. In extreme cases it should be given **intravenously** as a 1 or 2 per cent. solution, preferably dissolved in 10 per cent. **dextrose solution**. When given by mouth, 1 or 2 grains (0.065 to 0.13 Gm.) should be given every hour until the sodium chloride concentration of the urine is normal.

On the basis of clinical observation, Burrage and White (Amer. Jour. Med. Sci., Aug., 1927) believe that **digitalis** is of value in pneumonia when given in sufficient dosage.

R. Lynch and B. Webster (Can. Med. Assoc. Jour., Jan., 1928) tried to determine the value of **dextrose** in the treatment of lobar pneumonia as contrasted with that of **digitalis**. In 2 groups of 11 patients each, those in the dextrose series were given an intravenous injection of 250 c.c. of warm 20 per cent. **dextrose-saline solution**, daily in the mild cases and twice daily in the severe ones. It was continued until 24 hours after

the crisis. The patients were also put on a **diet** of 3600 calories, made up largely of dextrose combined with lime, lemon, or orange in the form of a drink. Meat broths supplied the protein and fat. In the **digitalis** series, an effort was made to secure digitalization as soon after admission as possible. The patients were started immediately on a course of **digitalein**, a hypodermic injection of  $\frac{1}{50}$  grain (0.4 mgm.) being given every 4 hours for 6 doses. At the same time they were given **tincture of digitalis** by mouth, 20 minims (1.2 c.c.) every 4 hours, for 6 doses, though this was varied according to the weight of the patient. Once the digitalis effect was obtained, the patients were given enough, either by hypodermic or mouth, to maintain it. In the dextrose group there were 9 recoveries and 2 deaths—mortality 18.1 per cent. In the digitalis group there were 7 recoveries and 4 deaths—mortality 36.3 per cent.

In acute pneumonia Nott (Brit. Med. Jour., July 17, 1926) tried a solution made by adding 2 grains (0.13 Gm.) of pure **potassium permanganate** to  $1\frac{1}{2}$  pints (750 c.c.) of water, which should be comfortably hot. From 3 ounces to  $\frac{1}{2}$  pint (90 to 250 c.c.) are used for each **rectal injection**, according to the age of the patient, the fluid being administered very slowly with a syringe, and repeated every  $2\frac{1}{2}$  to 4 hours during the first 24 to 36 hours. The length of the interval between the injections depends on what day of the disease the case comes under treatment. In ordinary cases, if the treatment is begun on the 1st or 2d day, intervals of 3 or 4 hours can be allowed, but when it is started on the 4th or 5th day, especially in severe cases, they may be reduced to  $2\frac{1}{2}$  or even 2 hours. The quantities the patient is able to retain on each occasion are also a guide, shorter intervals

being necessary when the fluid is quickly returned. Once the temperature reaches normal in adults and older children, the injections are reduced to 2 a day for 3 days, and once a day for 3 more days, when they can be discontinued; or they can be replaced, to the advantage of some, by giving the combined **thyroid** and **manganese** cachets for a week or so. But in infants and younger children, the injections should be continued twice daily for at least 10 days, after the temperature has reached normal, as there is a tendency to recurrence if they are given up too early.

L. E. Miller (So. Afr. Med. Rec., Dec. 11, 1926) tried injections of **sodium nucleinate** in 87 cases of lobar pneumonia and 30 of bronchopneumonia. There were 7 deaths among the lobar group and 4 among the bronchopneumonia group. The writer injects 0.1 Gm. (1½ grains) intramuscularly, repeating this in 48 hours if the temperature is still high.

On the plea that at present true lobar pneumonia is comparatively infrequent, the majority of cases being bronchopneumonia of mixed infection, Wynn (Brit. Med. Jour., Sept. 17, 1927) uses a **vaccine** containing equal parts of pneumococci, streptococci and *B. influenza*, 100 million of each. The results in 100 consecutive patients were that of 49 which were injected during the 1st 3 days, only 1 died—a pregnant woman who had had chronic asthma and who was confined 48 hours after the onset of pneumonia. Of 51 injected after the 3d day, 12 died. This shows the importance of treatment before dangerous intoxication has occurred.

**POLIOMYELITIS, ACUTE.**—**DIAGNOSIS.**—J. J. Moren (Ky. Med. Jour., Feb., 1927) states that

while frequently a history of a fall preceding the onset is given by the parents, he has never noted a frank poliomyelitis in severe traumatic cases or any other chronic or infectious disease. The opposite is true in encephalitis, he having seen it complicate injury, follow operations, etc.

In considering a diagnosis the onset and development of symptoms are important. Poliomyelitis shows paralytic symptoms early, usually in 3 to 5 days. Cases appearing in 8 days are on record, but these are exceptions, and if paralysis appears by the 8th day or later, other conditions must be suspected. *Multiple neuritis* frequently resembles poliomyelitis. In such a case the author based his diagnosis of multiple neuritis on the slow onset and loss of the deep or muscular sensation. In poliomyelitis such loss never occurs unless there is a pronounced inflammation of the cord proper, and if so the lesion becomes a myelitis and not a poliomyelitis. The initial symptoms of poliomyelitis seem to cause most confusion. The reaction to the infection shows most commonly in digestive upsets, pulmonary signs, or meningeal symptoms. In the past few years the appearance of *epidemic encephalitis* has added new diagnostic difficulties, in particular in the atypical cases with meningeal signs. The so-called neuritic or spinal type of encephalitis should not prove difficult to diagnose. The pain is not characterized by severity, as much as a constant ache. Some cases have typical root pains. The cases seen by the writer had a subacute onset, without paralysis or actual sensory loss. After a period of pain they either subside or develop cerebral symp-



toms characteristic of encephalitis, as delirium, lethargy, etc. In epidemic encephalitis rigidity is not a prominent symptom. Frequently there is a slight stiffness of the neck, but should it be pronounced the fever rises and the patient grows worse; it is then an unfavorable sign. In frank *meningitis* we have rigidity, the Kernig sign, and no Babinski. Encephalitis may show rigidity, a questionable Kernig, and a positive Babinski. Poliomyelitis with meningeal signs may show rigidity, may have a Kernig sign, and no Babinski. Part of this rigidity is a manifestation of pain in the muscles of the extremities, which is not noted in encephalitis.

Collier (Lancet, Feb. 12, 1927) refers particularly to *relapsing* cases, in which the patient seems to become apyrexial and convalescent, but after a few days redevelops symptoms, sometimes of alarming severity. One may perhaps anticipate the occurrence of a relapse by an unusually flat-topped temperature chart in the first few days, and by the fact that the so-called apyrexial interval contains little sudden jumps of temperature which suggest continued infection, instead of the usual rapid blaze, high peak, and rapid fall of temperature. Whatever the books may say about dreadful results in a relapse, the writer has never seen any harm occur, no occurrence of paralysis and no increase of paralysis. In fact, in 1 case with an 8th day relapse with very high fever and great restlessness and headache, it was obvious that the paralyzed legs were improving continuously in spite of the relapse.

*Apyrexial* cases without headache have been rare in Collier's experience. They occur only sporadically,

and mean infection in a partially protected subject. They do not occur in the epidemics. They are always of the pure spinal type, like most of the sporadic cases.

Two forms of *rash* in poliomyelitis are noteworthy. One is *herpes zoster*. There is strong clinical evidence that poliomyelitis in some cases invades the roots and the root ganglia, *e.g.*, in the cases with peripheral facial palsy with loss of taste. The other rash is a peculiar one consisting of large bluish-purple papules, not collected in bunches and distributed over the paralyzed region only.

According to F. C. Neff (Jour. Mo. State Med. Assoc., Aug., 1926), in the last few years sufficient knowledge has been accumulated to make possible the *early* recognition of poliomyelitis, even though there are few pathognomonic symptoms. The epidemic occurrence is, of course, the greatest single diagnostic feature. As for the symptoms belonging to the earliest stage: After an incubation period of a few days to one week, the prodromal stage appears, varying from a few hours to 3 days. The disease is at 1st a general systemic infection which is the same in all types and irrespective of the development of palsies. From the accepted fact that the route of infection is from the mucous membrane of the nose, throat and mouth, acute inflammation of these regions must be considered one of the early symptoms, although not always evident. The tonsils are reddened or enlarged. According to Goodpasture, there is an herpetic lesion in all cases. Looseness of the bowels or constipation in the child leads one astray in this early diagnosis. Vomiting is toxic and not pro-

jectile. There may be freedom from further symptoms for a day or two, but the physician is usually summoned because of fever which he finds to be from 102 to 105° F. This stays up until paralysis is well defined. Fretfulness, irritability and apprehensiveness, emotional or hysterical tendencies, are typical of the early stage. The child is found lying in a position indicating pronounced discomfort. The neck may be somewhat rigid, and attempts at examination will disclose pain on bending the head forward. There is marked spinal pain and tenderness and hyperesthesia over the whole body. Draper describes a glossy appearance of the sclera and cornea, and puffiness about the eyes. The child is not so alert or eager in the expression of the eyes and face, but is easily annoyed. There may be headache and backache. Cranial nerve involvement causes stupor, less pain, and no involvement of the peripheral nerves. Breathing is quickened. The deep tendon-reflexes are irregular and soon lost on the affected side, but normal, weak or exaggerated on the unaffected side. The pulse is higher than can be explained by the fever. The cerebrospinal fluid is suggestive and enables one to exclude purulent meningitis; it is not probable, however, that the sporadic case will have the necessary spinal puncture performed. Finally, motor paralysis appears in a few days, occasionally as early as 24 hours. It reaches its maximum in 3 or 4 days, occasionally not until a week.

The early diagnosis is most often confused with summer complaint, chorea, suppurative or tuberculous meningitis, and epidemic encephalitis.

**ETIOLOGY.**—A. C. Knapp, E. S. Godfrey, Jr., and W. L. Aycock (Jour. Amer. Med. Assoc., Aug. 28, 1926) have reported an outbreak of poliomyelitis, apparently *milk-borne*, in Cortland, N. Y., in Dec., 1925. The only cases occurring in this city of 15,000 people subsequent to the appearance of 3 cases more than 2 months previously had been, with 1 possible exception, in persons who had drunk milk from one dealer who sold less than 4 per cent. of the city's total supply. The cases were distributed widely enough to make it improbable for the milk supply to be a mere coincidence of geographic distribution. When to these facts were added that an actual paralytic case of the disease had existed on the dairy farm from which most of the milk came; that this patient had been milking cows and handling the milk for 4 days while in the acute stage of the disease, and that the time which elapsed between this period and the dates of onset of the subsequent cases was consistent with the generally accepted minimum and maximum incubation periods of poliomyelitis, the chain of circumstances is as complete as is found in the majority of milk-borne outbreaks of other diseases. While this outbreak points to transmission through milk, the writers are not of the opinion that this is the usual mode of spread of poliomyelitis.

Aycock (Amer. Jour. of Hyg., Jan., 1928) found that the *age-distribution* of poliomyelitis in Vermont showed a greater preponderance of cases in the younger age-groups in urban than in rural communities, the number of cases diminishing rapidly with increasing age. In a comparison of

the age distributions in urban and rural populations of measles, diphtheria, and poliomyelitis, it was found that the incidence of the disease in the various age-groups is directly proportional to concentration of the population. The fact that all 3 diseases possess the same age-distribution phenomena is evidence that the mechanism involved is identical for each of these diseases.

**TREATMENT.**—To *prevent crippling*, according to Pitzen (Jour. Amer. Med. Assoc., Mar. 3, 1928, from Münch. med. Woch., Dec. 9, 1927), the position of the patient should be such during the fever period as to put to rest and relax the spinal cord; this is best obtained with the **spine in lordosis**. He places a plank across the bed under the mattress and inserts a small pillow under the lumbar region of the patient. A **plaster shell** is useful with restless children or if pain is severe. When the fever has passed, the extent of the paralysis must first of all be determined. He advises against the electric current because it makes the children nervous, and uses the functional method. The complete examination can be made in 5 minutes.

When the condition of the muscles is known, contractures can be avoided with certainty by correct position. The best preventive of scoliosis is the **plaster bed**. Contracture of the tensor fasciæ latæ, a sequel of disease of the gluteal muscles, can be avoided by overextension of the hips. The author suggests a **mattress in 3 parts**, with the lower segment replaced by a wedge-shaped piece, the thin end at the foot of the bed. A sand-bag on the knee is used to obviate flexion contracture in the knee joint from

paralysis of the quadriceps. With a tendency to pes equinus, the patient should lie with the entire sole of the foot pressed against a box or stool placed at the foot of the bed. In paralysis of the deltoid, relaxation should be obtained by pillows inserted between the arm and the trunk.

The writer gets the patients on their feet as quickly as possible, believing that the impulse of the will is more powerful to set the muscles to work than is the electric current. Children with quadriceps paralysis or with paralysis of several of the thigh muscles must not be allowed to walk without apparatus. If the hip muscles are injured, going about on all fours must be forbidden as it leads to the worst contractures.

The importance of **early treatment** cannot be sufficiently emphasized. Complete **rest in bed** with the extremities in the most comfortable and supported position; **anodynes** when needed; if the spinal fluid is markedly increased, **lumbar puncture** to be done daily as long as this is the case; intramuscular use of 10 to 20 c.c. of **human convalescent serum** on the early days of the disease. Of 7 cases recognized during the preparalytic stage by Fleischner and Shaw and given convalescent serum or whole **citrated blood** intramuscularly, all recovered without any paralysis. For the next case the author sees he hopes to secure a convalescent donor, if possible, or an immune subject from whom to get blood for transfusion into the vein of the affected child.

Jones (Brit. Med. Jour., Apr. 30, 1927) recognizes that the virus is present in the mucous membrane of

the nasopharynx of infected persons, and that all persons in contact with the disease should cleanse their throats by gargling 3 times a day with a 1:4000 solution of **potassium permanganate**.

E. C. Rosenow and A. C. Nickel (Arch. of Int. Med., Jan., 1927) have reported the results obtained in 1113 poliomyelitis patients with an **anti-streptococcus serum**. This serum was that of horses which had been immunized by the injection of increasing amounts of 1st, the dead and, 2d, the living pleomorphic streptococcus isolated from patients with poliomyelitis. The serum was prepared almost entirely by intravenous injections of the streptococcus preserved in dense suspensions of glycerol sodium chloride solution. The injections of serum in patients were made intravenously or intramuscularly. In general, children up to the age of 2 years received at least 15 to 25 c.c. of serum; those from 2 to 5 years, 20 to 30 c.c.; those from 6 to 12 years, 25 to 50 c.c., and persons 13 years of age or more, 50 to 75 c.c. The interval between injections was usually 24 hours; or, in urgent cases, 12 hours. Out of a series of 109 cases, 94 showed noticeable improvement within 24 or even a few hours after treatment. In 9 cases the serum was given 7 days after the onset; of these, 5 seemed benefited. Among the total series of 1113 cases the mortality was much lower than in the 278 control untreated patients, especially when the serum was begun early, and even if there were bulbar symptoms. The incidence of residual paralysis was also much lower in the treated group, especially in those who received serum before or soon after

slight paralysis had developed. The good effects of the serum occurred independently of spinal drainage. The serum used possessed the power of neutralizing the toxic material contained in cultures of the streptococcus, as measured by intracutaneous injection. It diminished the infective power *in vitro* of the streptococcus as measured by intracerebral injection, and it cured rabbits inoculated intravenously with the streptococcus, properties not possessed by normal horse serum. The clinical curative action seems attributable to specific antibodies contained in the serum, and not to non-specific or foreign-protein effects.

Clarke (Nebr. State Med. Jour., Nov., 1927) reports the 7th case in which he recognized acute poliomyelitis before the onset of paralysis, at which time all the patients received **Rosenow's serum**. All recovered without paralysis. It is important, therefore, that the physician consider the disease as a possibility from June to November each year; that every case of slight illness in children be regarded with suspicion, and that careful clinical search be made for a possible poliomyelitis.

Discussing **electroradiologic treatments** in infantile paralysis, Laquerrière and Delherm (Médecine, May, 1926) deem it established that cases treated with the **galvanic current** show much less residual infirmity than the untreated, and often are benefited by the measure to an extreme degree. This conclusion is based on observations in many hundreds of cases. On the other hand, the value of Bordier's method of applying the **X-ray** over the spinal lesion is still doubtful. Spinal exposure with the X-ray should nevertheless be tried, as it might well be



expected to destroy new-formed tissues surrounding the normal cells and hindering their activities. **Diathermy** to the paralyzed extremities is used routinely by the authors only if there is manifestly poor circulation in the extremities, with coolness, chilblains, etc.; such cases are not very common. Diathermy must, furthermore, be applied with caution, lest deep burns requiring amputation occur. It is to be avoided in children too young to differentiate the discomfort caused by the treatment from a possible burn. The galvanic current should not be abandoned. It is particularly useful in cases for which the specialist is not available; the family can be taught to apply the treatment with an ordinary dry cell battery, and all have witnessed definite instances of benefit from such treatment.

If there is marked impairment of the local circulation, both the galvanic current and diathermy may be used. Later on, the muscular exercise afforded by the interrupted or reversed galvanic current or the **high frequency effluve**, or at a later stage of improvement, by the **faradic current**, permits of inducing hypertrophy of the undestroyed fibers and of restoring to the patient the habit of using the diseased muscles. One sees, for example, former paralytics who seem to have recovered yet, after having had no treatment for some years, exhibit faulty positions or begin to limp. A few electric treatments, by restoring tonicity to the deficient muscles, cause these manifestations to disappear. In general, with each renewal of electric treatments, after the necessary intervals of rest, further improvement is noticed, at a time when no spon-

taneous improvement could be expected.

#### **PREGNANCY.—DIAGNOSIS.**

—According to Leiser (Arch. f. Gyn., Jan. 31, 1927), pregnancy can always be diagnosed with the *X-rays* from the 14th week. He does not use pneumoperitoneum because of the risk of setting up uterine contractions. Blanche's (Paris méd., Feb. 5, 1927) researches, however, showed that the uterine fetal skeleton does not appear clearly in the roentgenogram before the age of 3½ months. Diagnosis of pregnancy can thus be made about 3 weeks before the appearance of clinical signs of the fetus proper. In the 2d half of pregnancy, roentgenograms may indicate the presentation and position of the fetus. They may show the respective positions of the fetuses in twin pregnancy. In Moller's case, 3 fetal heads were easily distinguished on the plates. X-ray examination may likewise reveal a hydrocephalus, monstrosity, and overriding of bones pointing to death of the fetus; also it is useful in the diagnosis of ectopic gestation, and in differentiation of a pelvic tumor from pregnancy. Exposures should be made with the pregnant woman lying on the abdomen or on the side, never on the back.

In a review of the methods of precision for the early diagnosis of pregnancy Hirst and Long (Amer. Jour. Med. Sci., June, 1926) state that the *alimentary glycosuria test* is the one in which most trust can be put. A new series of 150 cases is reported with 6 per cent. of error and 8 per cent. of error in non-pregnant women.

A special *vaginal stethoscope* has been devised by Falls (Amer. Jour.

of Obst. and Gyn., Mar., 1926) with which it is possible to hear the fetal tones before the 18th week. The instrument may be applied over the lower segment through the vagina. Being provided with a long handle, the bell can be introduced into the vagina, and the earpieces attached to the rubber tubes of an ordinary stethoscope. He has been able to diagnose pregnancy at about the 14th to 16th week in 20 patients. The vaginal stethoscope may also be used for the auscultation of the lower uterine segment in patients with placenta previa. At or near term there is audible a uterine souffle on both sides of the midline in the lateral fornices in normal cases. However, this normal uterine souffle was decidedly increased, noticeable even in the early months, in 2 patients with low-implanted placenta.

A *new test* for early diagnosis is recorded by Aschheim and Zondek (Klin. Woch., Jan. 1, 1928), which consists of injection of 1 to 2 c.c. of morning urine into young mice and noting the effect on the ovary. Castrated adult mice are used as controls. In pregnancy the urine contains a large amount of the hormone of the anterior lobe of the pituitary, and if the urine injected is from a pregnant woman, the young mouse ovary will exhibit the effects of the hormone. The authors used the test in 78 cases of pregnancy. It was unquestionably positive in 76 and positive on the 2d test in 1 of the remaining 2. It was possible to diagnose pregnancy as early as 5 days after the 1st missed menses. In 236 controls, the reaction was weakly positive in 3 cases of severe endocrin disturbances (myxedema and acro-

megaly) in  $\frac{1}{5}$ th of the cases of genital carcinoma, and in 2 persons without demonstrable endocrin disturbance.

Gauss (Zent. f. Gyn., Apr. 3, 1926) recalls a *sign* which he published several years ago—a modification of Hegar's. It is based on the fact that the cervix presents in the early months of pregnancy an abnormal motility, and may be easily pushed to either side without entailing a corresponding movement of the uterus. He found the sign in 146 of 148 pregnancies, including 1 in the 1st and 55 in the 2d month. The 2 failures, both in the 2d month, were corrected 10 days later. Outside of pregnancy the phenomenon is comparatively rare.

The *blood-pressure* and *urinalysis* were studied by F. A. Faught (Amer. Jour. of Obst. and Gyn., May, 1926) in 100 normal pregnancies. Of 675 urinalyses, 309, or 44.1 per cent., showed *albumin* alone or with other urinary abnormalities. Of the total primiparas, 12 per cent. went through their pregnancy without albumin being found in the urine, while 7 per cent. showed albumin in all their urine examinations. Of the multiparas, 10 per cent. showed no albumin, while 5 per cent. always had albumin in demonstrable quantity.

*Glycosuria* occurred in 4.3 per cent. of all specimens examined, being present most frequently in the 6th, 7th and 8th months. The percentage of glucose met was rarely over 1.5, the highest being 4.7, occurring once. The incidence of *indican* was slightly greater than glucose, indican occurring in 11.1 per cent. of all specimens examined, frequently in conjunction with glucose. There is

practically no difference in the average *blood-pressure* values in the primipara, as compared with the multipara.

The importance of *calcium*, of which the pregnant woman is being drained by the developing fetus, is such that the resulting low maternal calcium content causes both her and her offspring to be greatly exposed to complications. In a series of experiments in rats, Macomber (Med. Jour. and Rec., Apr. 21, 1926) found that a low calcium definitely affects fertility to a significant degree, and that it affects pregnancy and lactation by limiting the amount of calcium available for the fetus or nursing young and by causing a definite drain upon the mother. Animals which were not subjected to pregnancy or lactation showed the least drain, and those which had undergone pregnancy and lactation showed the most. The presence of calcium in the diet of the pregnant or nursing human mother becomes, then, a matter of the greatest importance.

Experiments by Bokelmann and Bock (Berl. klin. Woch., Dec. 17, 1927) showed that the dialyzable calcium is greater in the blood-stream supplying the fetus than in the maternal venous blood. The total calcium content, as well as the absolute value for dialyzable calcium in the blood serum of the umbilical vein, is considerably greater than in the serum of the arteries of the umbilical cord leading from the fetus.

As regards the influence of calcium on the blood-pressure, Stieglitz (Arch. of Int. Med., Apr., 1927), basing his observations on 222 blood-calcium determinations, states that hypocalcemia is not of major etiologic significance in arterial hypertension in pregnancy. Dur-

ing the final month of pregnancy a gradual rise in arterial tension is associated with a moderate hypocalcemia. Immediately after parturition a fall in blood-pressure occurs, with a corresponding rise in the blood calcium concentration. Coincident and probably associated with the onset of lactation, a secondary elevation in arterial tension occurs, with a corresponding and equally transient hypocalcemia.

Recently, an especial importance has been given to the *ovary in carbohydrate metabolism*. Of the 3 ovarian substances which Fellner (Med. klin., Dec. 3, 1926) has isolated, 1 acts against adrenalin glycosuria. With regard to this, namely that the restraining action is absent in depancreatized female dogs, the writer assumes that the ovarian hormone acts indirectly through the pancreas. Extirpation of the ovaries makes the organism accessible to hyperglycemia. This experience is contrary to that of Küstner. He observed that 72 hours after curettement of the uterus in 2 cases of premature birth, the tendency to alimentary glycosuria ceased and he concluded from this that the glycosuria is caused by the action of the fetus or of the placenta on the metabolism. On the other hand, a very small amount of grape sugar was sufficient to occasion an experimental glycosuria in pregnant rabbits from the day of impregnation.

**PROSTATE. — HYPERTROPHY.**—Zollschan (Zeit. f. Urol., xx, 420, 1926) found **massage of the prostate** decidedly effective in this condition. The tissue enclosing the prostate is stout, and there is much less danger of perforation than in the case of epididymitis.

In 125 cases **operated** by Ewell and McCallum (Jour. Mo. State Med. Assoc., Jan., 1928), there were 5 deaths, a mortality of 4 per cent. The causes of death were post-operative shock; angina pectoris; diabetes; uremia, and pulmonary embolism. All the operations were done by the suprapubic route and, with the exception of 6 cases, by the 2-stage method. The authors consider adequate **bladder drainage** and complete **hemostasis** as the 2 chief factors contributing to this low mortality rate.

Deep **X-ray** therapy is advocated by Lazarus (Jour. of Urol., Jan., 1927). It is divided into courses, each consisting of 4 exposures: A suprapubic, a sacral, a perineal and a rectal. The good effects are dependent on the ability of irradiation to reduce congestion, but it does not sterilize an infected prostatic focus.

Ten patients with complete retention of urine from prostatic disease were treated successfully by Remijnse (Ned. Tijd. v. Gen., July 30, 1927) with **electrocoagulation**. The method is suitable for all prostatic lesions that cause urinary retention.

The **conservative treatment** of aged patients with hypertrophied prostate in use in Bier's clinic is described by Hintze (Deut. Zeit. f. Chir., Mar., 1927). **X-ray** treatments are given at 2 or 3 days' interval, and between the 1st and 2d of each series 5 c.c. (reduced to 3 or 2 c.c. when the series is repeated) of **ox, hog or sheep blood** is **injected** slowly into the prostate,  $\frac{1}{2}$  of the dose into each  $\frac{1}{2}$  of the organ. The patient is in the lithotomy position during the injection and is afterward put to bed. The resulting pain is usually not great.

For each X-ray field the dose applied to the skin is 0.1 of the erythema dose. On the 1st sitting of the series the dose is doubled. In most cases, not more than 3 series of the X-rays are required. In the 19 cases reported, spontaneous micturition was achieved in all but 3 patients, who had accustomed themselves to self-catheterization and could not be persuaded to give it up.

In *chronic prostatitis*, of which Lukashoff (Klinich. Medit., Apr., 1927) reports 5 cases, **high frequency current**, employed alone, brought good results. The strength of the current was from 50 to 150 milliamperes; the force of the discharge, over 10,000 volts. A glass bougie containing the electrode was introduced into the rectum with the patient lying on his right side with flexed thighs.

**PROSTATECTOMY.**—**Punch prostatectomy** is commended by Bumpus and Vickery (Amer. Jour. of Surg., Mar., 1928) to meet the needs of *partial obstruction*. The symptoms of urinary obstruction are sometimes out of proportion to the amount of prostatic enlargement found on rectal palpation. They are usually due to enlargement of the median lobe of the prostate or to a contraction of the neck of the bladder due to cicatricial changes. Complete prostatectomy to remove such a small amount of obstructing tissue seems illogical and is often technically difficult. For removal of the obstructing portion only, instruments to be used through the urethra have been devised by Young, Caulk, and Braasch. The authors consider that the instrument devised by Braasch is best suited for this work as it is the only one with which the operation can be carried out under adequate vision. They performed 69 operations with this instrument, and in only 10 cases did febrile reaction of any consequence follow. The final results showed improvement in ob-



structive symptoms in 78 per cent. of cases. In 19 cases improvement did not result from the punch operation, and in 9 of these cases complete prostatectomy was performed.

**Extramuscular perineal prostatectomy** is advocated by Haim (*Zent. f. Chir.*, Feb. 19, 1927), who found that, contrary to general opinion, the external anal sphincter can easily be isolated from the rectum. Passing between the sphincter and the rectum and avoiding the muscular network where the fibers of the sphincter, the bulbocavernosus and the superficial and deep transversus perinei meet, one arrives in the space between the rectum on 1 side and the urethra, prostate, bladder and seminal vesicles on the other. The space contains only the soft connective tissue of the rectovesical septum. With spatulas the sphincter is drawn forward and upward, the rectum forward and downward. The bladder, or at least the urethra, must be pressed outward with a metal catheter. Advantages of the method are, according to the author, absence of shock and of the necessity for complicated dressings, and, finally, of a visible scar. The operation can easily be done under local anesthesia.

In 2 cases of *hemorrhage* in the course of prostatectomy and in a cystotomy, Dax (*Gaz. hebdom. des sci. méd. de Bordeaux*, Sept. 4, 1927) injected intravenously **sodium citrate**, 20 Gm. (5 drams); **magnesium citrate**, 10 Gm. (2½ drams); distilled water, 100 Gm. (3½ ounces). The solution should be filtered and sterilized in the autoclave. Magnesium citrate is included in the formula to obviate the hypertensive action of sodium citrate. The solution must be used immediately after being prepared, as it becomes toxic when old.

To control hemorrhage after prostatectomy, Millar (*Brit. Jour. of Surg.*, July, 1926) uses the **pilcher bag** and attaches a 1 or 2 pound weight to the urethral tube by means of string which passes over the bar at the foot of the bed, or over a pulley. The patient is thus left with the bag fitting snugly into the prostate pouch.

According to Wallace (*Lancet*, Nov. 19, 1927), the *mortality* from prostatic trouble has not materially fallen; conversely, that of prostatectomy has fallen from 20.2 per

cent. to 14.5 per cent. The surgeon has been more chary in performing the 1-stage operation, and the deaths that formerly would have been recorded under prostatectomy are now to be found under cystostomy.

**PROTEIN THERAPY.**—Rosa now (*Zeit. f. d. ges. exper. Med.*, July 20, 1927) asserts that protein therapy cannot take the place of specific serum and vaccine therapy.

Reports from various directions tend to suggest that this form of therapy is on the wane. Wolff-Eisner and Jahr (*Münch. med. Woch.*, Dec. 10, 1926) found experimentally that injections of foreign proteins are practically without influence on experimental infection with tetanus and on the action of ricin and of the toxins of tetanus and diphtheria. It made little difference whether the foreign proteins were injected before the main inoculation or after it. Yet the intraperitoneal injection protected guinea-pigs against 10 times the lethal peritoneal dose of cholera bacilli. The experiment seemed to show that the action consisted in a local inflammation which mobilized the defensive agents of the body.

Protein therapy in pediatrics was studied by Stoeltz (*Deut. med. Woch.*, Oct. 7, 1927), the doses of **serum** or **milk** injected in children ranging between 0.1 and 10 c.c. Daily injections were given on 5 successive days. Only very young infants are not subject to anaphylaxis. Horse serum, cow's milk, and certain protein preparations were used. The author was not satisfied with any of them. In his 189 cases, the children ranged from 8 days to 12 years in age, the intravenous dose from 0.05 to 0.8 c.c., and the subcutaneous dose from 0.05 to 2 c.c. In the great majority of the cases, no curative effect was apparent. Most of the local reactions were severe and slow to disappear.

Averett (*Amer. Jour. of Obst. and Gyn.*, Feb., 1927) treated 32 cases of **pelvic inflammation** with non-specific proteins—24 acute and subacute, and 8 chronic. He failed to obtain any beneficial result in the chronic cases. In the acute cases, the quickest and best results were obtained in those due to the gonococcus. The writer

uses sterile milk because it does not cause a shock reaction and does not entail dangerous phenomena.

**PRURITUS.**—In 7 cases of *senile* pruritus in women observed by Gall-erand and Meyer (Bull. Soc. franç. de dermat. et syph., Dec., 1926), the affection usually made its appearance after the menopause, and in some of them it had become so annoying that life seemed intolerable, causing insomnia, emaciation and irritability. The authors found that 2 or 3 **injections of testicular extract** were followed by diminution and even cessation of the pruritus. In order to eliminate the possibility of suggestion, physiological salt solution was injected by way of control, but this had no effect.

Sézary (Bull. méd., Dec. 28-31, 1927) uses ampoules of 10 c.c. of a sterilized solution of **sodium bromide** containing 10 Gm. ( $2\frac{1}{2}$  drams) of this compound per 100 c.c. ( $3\frac{1}{3}$  ounces) of a **sodium chloride solution** (7.5 : 1000). Pruritus patients received daily injections, **intravenously**, of from 10 to 15 c.c. In 29 cases treated, cure was effected in most of those in which the pruritus was not associated with severe organic lesion. Intravenous bromotherapy acts mainly through its sedative effect on the nervous system.

For the itching in *skin diseases in children*, Bornikoel (Monats. f. Kind., July, 1927) recommends, in severe cases, that the part be bandaged and quieting remedies be given the child, such as **chloral hydrate**. **Amyl nitrite** is added to the treatment of the underlying dermatosis in recent and chronic infantile *eczema* and in *dermatoses of nervous origin*; **calcium** preparations are good in *strophulus*.

**Hamamelis ointment** seemed to have the greatest influence, especially in combination with **ethyl aminobenzoate** and **procaine hydrochloride**. In chronic forms and also in *eczema* of nervous origin, **coal-tar** was effective; in *strophulus*, **sulphur baths** brought about retrogression, especially of the itching. In *dermatoses* of nervous origin and in *strophulus*, the child's **environment** should be **changed**, with attention to hygienic and psychic conditions.

**PSORIASIS.**—Bernhardt (Ann. de dermat. et syph., Jan., 1926), in a review of the various theories concerning the etiology of psoriasis, parasitic, nervous and endocrin, concludes that the latter or *endocrin* origin has the best foundation and is winning an ever increasing number of partisans. Without being able to decide to which endocrin gland falls the rôle of sensitizing the skin, the author gives the following figures from his personal observations: Hypofunction of the thyroid, 30 per cent.; of the thymus, 21 per cent.; of the ovaries, 16 per cent.; hyperfunction of the thyroid, 12 per cent.; of the ovaries, 6 per cent.

**TREATMENT.**—R. Carillon (Rev. franç. d'endocrinol., Feb., 1926) reports an investigation of the relationship of the endocrins to psoriasis and its treatment. **Thyroid, ovary, parathyroid, pituitary** and **thymus** have all been tried therapeutically, with good results, in particular, from the last 2 of these. No single ductless gland can be held responsible, through its deficiency of function, for all cases of psoriasis, but whenever a given endocrin disturbance can be described and the indicated endocrin

product administered, the psoriasis automatically disappears. The sympathetic system, which regulates skin nutrition, is the link between the endocrins and the skin. By drug tests, as with atropine, adrenalin, pilocarpine and amyl nitrite, the writer found that while some patients with psoriasis are vagotonic, a larger number are sympathicotonic. Vago-sympathetic imbalance can be demonstrated in all cases of psoriasis, and disappears along with the latter. In but few cases is the sympathetic disturbance dependent upon some endocrin disorder. Where tests of endocrin function have proven negative and organotherapy failed, the imbalance may be due to toxic factors, sensitization or hemoclastic shock. Favoring causes of psoriasis are, in some instances, heredity; more often, the sequelæ of acute or chronic infections, including tuberculosis and syphilis, which often react on 1 or more ductless glands. The least additional external irritation, as by trauma or infection, excites the eruption of psoriasis. Aside from the usual external treatment, which takes care of the latter factor, the sympathetic tonus should be corrected by the use of drugs such as **adrenalin**, **pilocarpine**, **eserine**, **atropine**, etc. Where there are clinical or laboratory evidences of a specific endocrin disorder, the corresponding form of organotherapy will cure the disease; if there are no such evidences, **thymus extract** or **insulin** may be tried. In addition, ordinary constitutional measures should be prescribed aiming to reduce the predisposition to psoriasis and improve the patient's general condition. The author lists 4 cases of psoriasis with vago-

sympathetic imbalance, cured by **thymus extract**; 5 with hyperthyroidia, cured by **pituitary extract** or **serum of thyroidectomized animals**; 2 with hypothyroidia, cured by **thyroid extract**; 1 with ovarian insufficiency, cured by **thymus** and **ovary**, and 1 with testicular insufficiency, cured by **adrenalin** and **testicular extract**.

F. F. Ward (Med. Jour. and Rec., Aug. 17, 1927) reports cure in several cases from hypodermic injections of a liquid **thymus extract** specially prepared for him in ampoules by Harrower. The injections should be given daily, if possible, but not less than 3 times a week, for at least 1 month. They may be given either in the gluteal or other muscles, as there is no local or constitutional reaction. In each of the writer's cases hygienic faults or sources of infection were sought out and endeavors made to place the patient in the best physical condition, but all this had been done before in some of the cases, without change in the psoriasis until the thymus injections were begun. Giving thymus by routes other than the hypodermic is useless.

According to Ravaut, Bith and Ducourtioux (Zent. f. inn. Med., June 19, 1926), psoriasis patients with hepatic insufficiency are favorably influenced by **insulin**. Generally 45 units of the latter were given daily for from 20 days to 2 months.

W. F. Castle (Practitioner, May, 1925) finds the **mercury vapor lamp** very successful in psoriasis. This is probably related to the fact that psoriasis shuns those parts of the skin which are normally exposed to the sun's rays, *viz.*, the face and hands. By creating an atmosphere of artificial sunlight, one reproduces as

nearly as possible the conditions inimical to the development of psoriasis. The exposures are of short duration. In the majority of cases, 6 exposures suffice to cause the scales to drop off, leaving a smooth patch which is considerably lighter than the surrounding skin; soon, however, no trace of the disease remains. Long-standing cases require more treatment than those of recent origin, but the author has yet to meet with a case not greatly benefited.

J. F. Smith (Brit. Jour. of Derm., Jan., 1925) treated 57 cases with **intravenous injections of sodium salicylate**. These injections caused disappearance of the eruption in 16 per cent., its almost complete disappearance in 18 per cent., and its distinct amelioration in 14 per cent. Provided the dose did not exceed 3 Gm. (45 grains), in 12 c.c. (3 drams) of water, no unpleasant effects were noted. Exfoliative dermatitis ensued in 6 per cent. of the cases, but its connection with the treatment is uncertain. Several difficult cases, including 1 resistant to a great variety of measures, were cleared by these injections. While unsuited for routine use, the method is worth a trial in selected difficult cases. The injections were generally given 2 or 3 times a week.

A. Versari (Rif. med., May 3, 1926) used intramuscular injections of **sodium and potassium tartrobismuthate (trépol)**. The preparation is equivalent to 0.08 Gm. of metallic bismuth per cubic centimeter, or 0.1 Gm. of the salt. Injections were given up to a total dose of 5 Gm. of the salt. In 12 out of 21 cases of ordinary psoriasis complete disappearance of the lesions was obtained;

in the other 9 cases, partial disappearance. One patient remained cured for 2 years; in all the others the eruption eventually reappeared in a milder form. The best results were obtained in the generalized, very scaly, ostracoid forms of the disease.

P. Ravaut (Presse méd., May 25, 1927) recalls that destruction of 1 wart is sometimes followed by disappearance of all the other warts existing on a patient's skin. Similar occurrences have been noted in leprosy, nevocarcinoma, and skin tuberculosis. Along the same lines the writer tried destroying by **electrocoagulation** a few small, separate lesions of psoriasis. In 2 cases of extensive psoriasis of long standing, he witnessed disappearance of all the other lesions after a few sittings of electrocoagulation. He recognizes in this, not suggestion, but a cytologic or bacteriologic action justifying the term "**autodermotherapy**."

Serna (Rev. esp. de urol. y dermat., Feb., 1926) obtained complete cure in 4 cases with **intravenous injections** of a 50 per cent. solution of **sodium salicylate** at 2 or 3 day intervals, never giving more than 4 Gm. (1 dram) in 1 day, to a total of 20 or 30 Gm. (5 or 7½ drams). In 2 other cases the salicylate failed, so he injected **emetine** subcutaneously at weekly intervals, to a total of 0.45 or 0.55 Gm. (7 to 9 grains) in 29 and 35 days. The local measures were continued with both, as also **organo-therapy** in the hypogenitalism type, and **glucose** in the seborrheic type. The pruritus subsided first and the pigmentation last.

Intramuscular **bismuth** injections are beneficial in psoriasis. This had previously been noted by Horta



Ganns and A. Versari. Michailow (Derm. Woch., Dec., 1925) treated 25 cases of psoriasis vulgaris with the Russian preparation of bismuth known as **bijochinol**. In 2 of these there was complete disappearance of the rash. In 20 cases there was little improvement without local applications, but combining both, the results were favorable. In 2 others there was no improvement even with local applications and bismuth injections, and in 1 case there was an exacerbation of the disease. Catapano (Rif. med., Apr. 18, 1927) also reports good results in the treatment of psoriasis with injections of a **bismuth** preparation.

Marceron (Paris méd., Jan. 21, 1928) observed that an intense erythema caused by light rays acts very favorably on psoriasis. The rays of the **sun** may be used, but the most practical source of short rays is the **mercury vapor quartz lamp**. Because of the pain, however, only a limited surface should be exposed at 1 time, the patients being advised of the pigmentation to follow exposure. Usually it is sufficient to produce a severe erythema twice in succession over 1 area to free it of all lesions of psoriasis.

Toomey (Urol. and Cut. Rev., Feb., 1928) tried **colloidal gold** in psoriasis, and concludes that it gave better results than other remedies. He uses **gold tribromide** in colloid form, also Lange colloidal gold, administered orally or intravenously.

**PUERPERAL ECLAMPSIA.**—Typical eclamptic attacks in the newborn child of an eclamptic mother were observed by Schwarzkopf (Zent. f. Gyn., Mar. 26, 1927). The child was well developed, the birth was spon-

taneous and the maternal pelvis was not contracted. There were no grounds for suspecting brain hemorrhage. The mother was a primipara, aged 36; she had had a number of eclamptic attacks before entering the clinic, and had 6 while there. The attacks of the child began 13 hours after birth. On the 1st day of life, there were 4 attacks, on the 2d day 6. Under the use of 0.2 Gm. (3 grains) of **calcium chloride** 6 times daily, they diminished in frequency, and ceased entirely after the 4th day. Both mother and child recovered. The author concludes that the toxin circulating in the mother's blood passed the placenta and entered the circulation of the child. A similar instance was reported by Loebel (*ibid.*, July 9, 1927), in which the eclamptic mother was delivered by Cesarean section.

Pouget and Gautier (Bull. Soc. d'obst. et de gyn., p. 742, 1924) observed a case of eclampsia following the birth of a large child and the administration of 0.05 c.c. ( $\frac{5}{16}$  grain) of pituitary extract, the effect of which was to start a "storm of contractions." The blood-pressure after the attack was 195 mm. Hg. Next morning, the patient being better and conscious, it had dropped to 169. It is believed that the high blood-pressure brought on the eclamptic seizures. In 10 cases of eclampsia observed by Seynsche (Monats. f. Geb. u. Gyn., Jan., 1928), 6 showed a blood-pressure above 170 mm. Hg.

Suggestive in this connection are the experimental studies of Louros and Schmechel (Arch. f. Gyn., Jan. 31, 1927), which revealed a causal connection between *vagotonia* and eclampsia. They hold that the vagal

predominance is caused by defective metabolism of proteins, fats and mineral salts and by disturbance of the acid-base equilibrium. Their therapeutic conclusion is that a superabundance of protein, fat, salt or water is to be avoided in the diet of the pregnant woman. Closely associated with this process probably is the evidence submitted by Dodds and Willetts (Amer. Jour. of Obst. and Gyn., Mar., 1928) to the effect that in eclampsia the disturbance in *carbohydrate metabolism*, heretofore assumed, actually exists, and that it is apparently the result of the carbohydrate deficiency in pregnancy. Contrary to the general opinion, hyperglycemia is not characteristic of eclampsia. Serial blood-sugar readings during an attack of eclampsia showed wide fluctuations in exceedingly short intervals of time. Similar series in normal pregnant women near term showed no variations of this character.

**PROPHYLAXIS.**—Hendry (Can. Med. Assoc. Jour., Jan., 1927) advocates the **salt-free diet** in pre-eclampsia. The edema disappears uniformly, the patients are not starved, and general improvement is usual. He deems restriction of salt in the diet of all patients in the last  $\frac{1}{2}$  of pregnancy of decided value as a preventive measure. Bland and Bernstein (Amer. Jour. Med. Sci., June, 1927) studied the value of a **salt-free diet** in the treatment of the pre-eclamptic toxemia, meaning by "salt-free diet" a diet such that the chloride excretion in the 24-hour urinary output does not exceed 1 Gm. (4 drams). Of the mothers in the 13 cases studied 12 are still alive. Of 15 children born, 8 are living and well; 4 were still-born.

**TREATMENT.**—In Waldstein's (Zent. f. Gyn., July 9, 1927) clinic the total mortality in 117 cases of eclampsia was 1.7 per cent. If diet fails to prevent oliguria, headache and ocular symptoms in the pre-eclampsia condition, **venesection** or **delivery** are carried out. In eclampsia at the end of pregnancy and at the beginning of the 1st stage of labor, **Cesarean section** is the method of choice. If the 1st stage is well advanced, and the condition is not growing worse, he waits until delivery by the vagina is possible. Then it is hastened as much as possible. If attacks occur after delivery, he performs 2 or 3 venesections, withdrawing a total of 1000 to 1500 c.c. (2 to 3 pints) of blood, then gives a saline infusion. **Phenobarbital** is given to all eclamptic patients, but not over 3 doses of 0.3 Gm. (5 grains) each in 24 hours.

Lévy-Solal, Dalsace and Grillet (C. r. Soc. de biol., Mar. 18, 1927) found an increased amount of phosphorus in the blood of pregnant women in whom eclampsia was threatened. The calcium was reduced, especially in cases of twin pregnancy. The hypocalcemia was associated with increased acidosis and a decreased alkali reserve. Therefore the authors use **calcium** and **alkalies** with **pilocarpine hydrochloride** in the treatment of eclampsia.

Lazard, Irwin and Vruwink (Amer. Jour. of Obst. and Gyn., July, 1926), in a report on 142 cases, state that the **intravenous** use of **magnesium sulphate** in sufficient dosage will prevent the development of convulsions and will control them after their onset. A series of cases is presented in which the treatment shows a cor-

rected mortality of 9 per cent. The true nephritic type shows the greatest mortality.

Wodon (Bruxelles-méd., Dec. 12, 1926) obtained good results from **magnesium sulphate**. He advocates Lee Dorsett's method of **intramuscular** injections. From 3.5 to 4 Gm. (54 grains to 1 dram) of the salt, in a 10 to 50 per cent. solution, is given in 1 injection. The injections are repeated according to the gravity of the case. By-effects were never observed. Convulsions yielded to 1 injection; micturition increased, and edema disappeared rapidly.

Of 36 patients with eclampsia treated by Rucker (Va. Med. Mthly., Dec., 1927) with **magnesium sulphate**, 26 received a single intravenous injection; 6, 2 intravenous injections, and 2, 3 intravenous injections. In 2 cases the salt was given intramuscularly. There were no untoward effects, and no maternal deaths, while in 10 cases not treated with magnesium sulphate, there were 2 maternal deaths. In the 40 cases in which the outcome of the baby is known, there was a fetal mortality of 53.6 per cent. The fetal mortality in the group treated with magnesium sulphate was 45.1 per cent.

**PURPURA.**—Rosenthal (Jour. of Lab. and Clin. Med., Jan., 1928) divides the purpuras into 3 main groups: (1) Purpura characterized by a diminution of the blood platelets with or without alteration of their functions; (2) purpura due to some change in the function of the platelets without a diminution of their number; (3) purpura due to changes in capillaries. The blood-picture in the 1st group is diagnostic in cases

of acute and chronic thrombocytopenic purpura, acute and chronic aplastic anemias, and symptomatic thrombocytopenic purpura. The 2d group, chronic hereditary thrombasthenic purpura, is rare. The 3d group is purpura due to conditions which affect the capillaries. A classification is presented as a result of a systematic study of 172 cases showing purpura as a primary or secondary symptom.

**TREATMENT.**—Fitz-Hugh (Atlantic Med. Jour., Apr., 1926) recommends the following measures for any case of *purpura hemorrhagica*: (1) **Blood transfusions**, to be repeated according to indications and effects; (2) massive **irradiation of the spleen**, repeated unless leukopenia develops (a danger signal), and (3), as a somewhat heroic though decidedly promising procedure, **splenectomy**.

Of 58 cases of purpura hemorrhagica reported by Williamson (Arch. of Dis. in Childh., Feb., 1926) in which **splenectomy** was resorted to, 50 patients are well, 2 are improved, and 6 are dead. The operation should be reserved for chronic cases. These fall into 2 groups: (1) Those in which chronicity with severity so interferes with the normal life of the subject that a state of chronic invalidism is established; (2) those in which the severity of the hemorrhages and the frequency of its occurrence constitute a real danger to the life of the patient.

The special form of grave purpura due to *essential thrombopenia* was cured at once by **splenectomy** in a case described by Reilingh (Ned. Tijds. f. Gen., Jan. 30, 1926). The bleeding-time was 40 minutes and there were scarcely any thrombocytes to be discovered before the splenectomy. The

latter was followed by a drop to 14 minutes at once, while the monocytes ran up from zero to 1 million in about 2 weeks. The discovery of the thrombopenia in the blood gave the clue to successful operative treatment. The hemoglobin percentage dropped to 50, but gradually rose to 80 in 3 months.

**PYELITIS.**—In *infancy*, according to Gorter (Rev. franç. de péd., Apr., 1926), there are no characteristic signs of the disease except excessive pallor and swelling of the face. Examination of the urine, however, resolves all doubts. The microbes in the urine belong chiefly to the paracolonic bacillus group. The bacilli rarely penetrate into the renal pelvis by the urethral route, the infection being chiefly hematogenous. In his typical cases the pyelitis disappeared completely after 1 or 2 weeks. Coexistence of a congenital malformation in the urinary apparatus seemed to be responsible for the chronic form of the disease. The mortality was *nil* among the 53 children over 1 year; it did not exceed 10 per cent. in the 61 below this age. Large doses of **alkaline citrates** seemed to influence favorably the course of the pyelitis. **Colon bacillus vaccines** helped in certain cases, as well as daily irrigation of the bladder with a 0.1 per cent. **silver nitrate solution**.

Chown (Arch. of Dis. in Childh., Apr., 1927) considers the term pyelitis of infancy a misnomer. The common lesion is a multiple, focal, suppurative, interstitial nephritis, with which is associated occasionally some degree of pyelitis, and rarely cystitis. The lesion is usually bilateral, but when it is unilateral it is more often right-sided than left-sided. Rarely,

the lesion found is an acute glomerulitis, or a cystitis. Pyelitis as a sole lesion seldom, if ever, occurs. The commonly associated bacterium is probably *B. coli*. The renal lesions are usually secondary to an inflammatory process elsewhere.

**TREATMENT.**—The drugs most commonly used by van Duzen (Tex. State Jour. of Med., Feb., 1927) in the treatment of pyelitis were **methenamine** and **sodium acid phosphate**. The methenamine was alternated with an alkaline diuretic, preferably **potassium citrate**, at intervals of 3 to 7 days. Sodium citratocarbonate did not prove satisfactory, and, contrary to various assertions, caused gastric disturbance at times. In a few cases **phenyl salicylate** was substituted. Hexylresorcinol has been a disappointment. **Mercurochrome** has been given intravenously in a few cases of marked sepsis with gratifying results; however, its use in chronic cases was without benefit. **Blood transfusion** became necessary in several cases. **Autogenous vaccine** was used in 1 case with favorable results. A few patients with ureteral stricture, who continued to have periodic, cramp-like pains along the ureters after thorough dilation, were relieved by tincture of **belladonna**, 10 drops 3 times a day. **Cystoscopic treatment** was resorted to in 67 per cent. of the cases. It was not attempted until medical treatment had been given a thorough trial. **Silver nitrate** in 0.5 to 2 per cent. solutions was used as a routine measure for pelvic lavage.

**PYELONEPHRITIS.**—According to Runeberg (Finska Läk. Handl., Apr., 1926), **absolute rest in bed** is imperative until a week or 2 after



the temperature has returned to normal. He has the patient drink up to 3 liters (quarts) of fluid each day; **alkaline mineral** waters and **milk** only in moderate amounts. While there is fever, **protein** and **salt** should be **avoided**.

Braasch points out that (Jour. of Urol., Feb., 1927), with chronic pyelonephritis, complications may arise that demand surgical treatment. When such complications are unilateral and do not yield to the usual methods of treatment, **nephrectomy** may be indicated even though the renal infection is bilateral. He has not found palliative operations, such as nephrorrhaphy, decapsulation, pyelotomy with drainage, or nephrotomy, of any value in any case of chronic pyelonephritis.

**PYLORIC STENOSIS.**—According to Foote (Amer. Jour. Dis. of Childr., Feb., 1927), George Armstrong, a London physician, in 1771 reported the 1st case of congenital pyloric stenosis.

As stated by Crohn (Jour. Amer. Med. Assoc., Jan. 21, 1928), the present conception of congenital pyloric stenosis is that of a disease of infancy, the symptoms of which occur soon after birth and are limited in time to the 1st few months or, occasionally, years of childhood. Much as the subject matter has been discussed and studied by pediatricians and surgeons, little regard has been paid to the fact that cases treated medically and relieved of symptoms might possibly carry over into adult life. In reporting a case observed by himself in a woman of 45, he refers to 7 cases reported by Maylard in 1904, and to the opinion of Mayo-

Robson and Moynihan that a degree of congenital stenosis is a frequent, though unrecognized, cause of dilatation of the stomach in adults—as was probably the case in the author's patient.

A study based on experimental pyloric obstruction in 12 dogs enabled Ivy, Droegmuller and Meyer (Arch. of Int. Med., Oct., 1927) to confirm the indirect observation of Hamburger and Friedman that experimental pyloric obstruction causes a hypernormal secretion of gastric juice in some cases.

**TREATMENT.**—According to Estella y B. de Castro (Arch. Españ. de ped., Mar., 1926), there are no certain signs for differentiation of the organic and functional forms, and consequently, medical measures should be given a thorough trial before operation is resorted to. **Thick cereal** owes its efficiency not only to its consistence but to the abundance of carbohydrates and the lack of fats.

The frequency with which each of the 4 cardinal symptoms of pyloric stenosis occurs in infants was reviewed by Tisdall, Poole and Brown (Amer. Jour. Dis. of Childr., Aug., 1927) in 120 cases. The **Rammstedt operation** was performed in all, with a mortality of 13.2 per cent. for the whole series, the diagnosis of pyloric stenosis being confirmed in every instance. Visible gastric peristalsis was noted in 96 cases; projectile vomiting was present in 113 cases; pyloric tumor was palpable in 111; constipation was present in 105.

Of 34 cases of stenosis of the pylorus in infants, reported by Seifert (Monats. f. Kind., Oct., 1927), 9 were treated conservatively and 25 surgically by the **Weber-Rammstedt** method. Of the 1st group, 7 children died.

**Dietetic treatment** is useful only in mild cases in which considerable improvement occurs within 2 weeks after the instillation of the treatment. In the 2d group the typical pyloric tumor was present in 23 cases.

In 48 cases Strachauer (Ann. of Surg., Jan., 1927) performed 2 **gastroenterostomies** and 46 **Rammstedt operations** with the loss of 1 infant, a mortality of 2 per cent.

Ladd (Boston Med. and Surg. Jour., Feb. 10, 1927) urges that the treatment of congenital pyloric stenosis be surgical in all cases except those of the milder type of the disease; that prolonged or unsuitable medical treatment before the infant is sent to the hospital is still the most

common cause of mortality, and that the surgical operation of choice is **pyloroplasty**, because of its resulting low mortality and ease of performance. The cure is permanent.

#### **PYORRHEA ALVEOLARIS.**—

The *Endameba gingivalis* was present in direct smears in 95.5 per cent. of 201 cases of pyorrhea examined by Fisher (Amer. Jour. of Physiol., Mar., 1927). Evidence is submitted that this ameba is a harmless parasite. *B. fusiformis* and spirilla were found in the smears from all cases of pyorrhea studied, and in all the normal gums. *Streptococcus viridans* was present in each of 30 cases of pyorrhea examined culturally.

### Q

**QUINIDINE.**—According to C. W. Barrier (Jour. Amer. Med. Assoc., Sept. 3, 1927), quinidine theoretically has a use in the treatment of all the **arrhythmias**, since all are based on the circus movement, which quinidine overcomes. In chronic **auricular fibrillation**, 40 to 68 per cent. of the cases are restored to normal cardiac mechanism by it. Usually the cases with mitral fibrillation respond better than those with sclerotic fibrillation, and likewise the patients with small hearts or with coarse auricular waves in the electrocardiogram. On the 1st day 2 test doses of quinidine sulphate of 2 grains (0.13 Gm.) each should be given; on the 2d day, 3 doses of 6 grains (0.4 Gm.) each, the 3d day, 4 such doses, and on the 4th, 5 doses. Normal rhythm should ensue on the 5th day. It is important to give frequent doses rather than large doses at longer intervals, because of the rapid excretion of the drug. Patients have been rationed on as high as 20 grains (1.3 Gm.) a day for years without deleterious effects, while in others 6 grains (0.4 Gm.) suffice. Proper management to insure success with quinidine in-

cludes rest in bed with proper control of sleep, diet and fluid intake. Cardiac reserve should have been restored by rest and digitalis, but too recent an overdigitalization should be avoided. Digitalis retards the restoration of normal mechanism, and should not precede quinidine unless there is heart failure. Where digitalis is constantly needed to maintain cardiac competence quinidine is not indicated. Other cases to be eliminated are the aged and those with marked hypertrophy, active endocarditis, or significant changes in the T waves or Q-R-S complexes.

In **paroxysmal fibrillation** quinidine acts even more satisfactorily than in chronic fibrillation. In some, attacks are warded off by as little as 3 grains (0.2 Gm.) a day. In **premature contractions** the writer was able to abolish the arrhythmia with quinidine in over 90 per cent. of the cases. Auricular and ventricular extrasystoles yield equally well to the drug, of which usually not over 3 doses of 5 grains (0.3 Gm.) a day are needed, later reduced to 5 or 10 grains (0.3 or 0.6 Gm.) a day. While the pulse-rate is usually raised owing to

the action of quinidine on the vagus, the treatment tides the patient over a nervous period of cardiac consciousness. Quinidine is fairly reliable in auricular **paroxysmal tachycardia**. Most patients who take it consistently are relieved of attacks.

Using quinidine sulphate, 5 grains (0.3 Gm.) once daily, in **paroxysmal tachycardia** to prevent recurrence of attacks, F. W. Price (Practitioner, May, 1927) found it successful in most instances.

According to L. F. Bishop (Med. Jour. and Rec., July 6, 1927), quinidine, 2 grains (0.13 Gm.) 3 times a day, fills the place of a mild cardiac sedative and also acting as a bitter tonic that benefits the appetite and acts as a possible inhibitor of any obscure malarial tendencies that may exist. It is a good remedy to alternate with digitalis, being distinctly antagonistic to some of the symptom-producing properties of the latter drug.

In the perfused frog's heart, M. Cattell (Jour. of Pharm. and Exp. Ther., May, 1926) found that the speed of digitalis action was slowed by previous exposure of the heart to quinidine solutions. It took on the average 66 per cent. longer for the digitalis to produce its characteristic effects when the heart was 1st perfused with quinidine. Quinidine added to the digitalis solution was ineffective in delaying the action of the latter drug. Using weak solutions, the characteristic digitalis standstill could sometimes be entirely prevented by the use of quinidine. A heart poisoned by digitalis so that the ventricular contractions have practically ceased may be revived more rapidly with a quinidine solution than with Ringer's solution alone. Digitalis appears not to modify the action of toxic concentrations of quinidine.

**QUININE.**—Investigations by G. Singer (Wien. klin. Woch., Oct. 6, 1927) suggest that quinine, especially in its soluble double salts, produces a direct stimulation of the smooth muscle of the *intestine* apparently analogous to its action on the bladder and uterus. Positive results were obtained with quinine in 54 out of 72 cases of **constipation**. Rectal ad-

ministration gave much better results than intravenous or subcutaneous use. Of 30 patients receiving quinine dihydrochloride suppositories, 4 grains (0.25 Gm.) in each, 28 responded, usually within a few minutes, at the longest within 2 hours. In other cases small enemas consisting of  $\frac{5}{8}$  ounce (25 c.c.) of a 2 per cent. solution were used. Other salts, used intravenously, subcutaneously or intramuscularly— $2\frac{1}{2}$  drams (10 c.c.) of a 5 per cent. solution—were the dihydrochloride-carbonate and the dihydrobromide. Quinine treatment may prove of value in **post-operative intestinal paresis**.

Harnik (*ibid.*, July 28, 1927) maintains that intestinal contractions induced by quinine strengthen **labor pains**. The fetus also reacts by the passage of meconium. That the mother seldom reacts by defecation after quinine may be due to mechanical hindrance through pressure or to previous emptying of the bowel by irrigation. The fetus is rather sensitive to quinine, which may not be entirely harmless to it. In a case reported by Gellhorn (Amer. Jour. of Obst. and Gyn., June, 1927), death of the fetus promptly followed an ordinary dose of quinine with castor oil for induction of labor, and the fetus was expelled in a macerated condition 17 days later.

Regarding **malaria**, A. McKenzie (Kenya Med. Jour., Jan., 1927) asserts that there is an optimum dose of quinine in malaria treatment or prevention, any dose above which is wasted and anything below it inadequate. The average figure lies between 10 and 20 grains (0.65 and 1.3 Gm.). Quinine is useless unless parasites are present in the blood, and antirelapse treatments are far too long. The writer would not have any one take quinine prophylactically. Quinine does not act by its direct action on the parasite but in conjunction with some mechanism of the host. Primary attacks are very easily cured if the patient has not been previously quininized; long periods of quininization probably exhaust the body's capacity of dealing with the parasite, perhaps by lessening its reaction to quinine.

## R

**RACHITIS.—PROPHYLAXIS.**

—In the prevention of rachitis in newly born babies Aurnhammer (Arch. f. Kind., Dec. 3, 1926) administered **buttermilk irradiated with ultra-violet rays**. Of 11 premature babies, only 1 showed rachitic symptoms, which disappeared after 22 days. In 17 rachitic children irradiated buttermilk caused a cure in an average of 36 days. The rays prevent destruction of vitamine C in the buttermilk and simultaneously enhance the effects of vitamine B.

Out of 5 feeble pairs of twins, Jundell (Monats. f. Kind., Jan.-Feb., 1928) treated 1 child in each pair prophylactically with **codliver oil** (without phosphorus); the others were left untreated. Up to the time at which the maximum development of rickets might be expected, the children in each pair received the same food. The children remained continuously in **red light** (only during the winter months was the red paper removed from the windows). All the children of pairs 2, 3 and 4, as long as they received butter meal food, received also 3 teaspoonfuls of **lemon juice** daily. Of the 1st pair, who received no lemon juice, 1 child, the 1 that had been treated prophylactically, developed a slight case of scurvy. The prophylactically treated children remained, according to all examinations, free from rickets, while all the untreated children had the disease more or less severely.

In a correlation of the clinical and X-ray evidence of rickets observed at the various age periods by M. G. Wilson (Amer. Jour. of Dis. of Childr., May, 1926), he showed that

active rickets is encountered most frequently in the 1st 6 months of life, and healing rickets after 6 months. There did not seem to be any relation between the degree of rickets observed and the amount of codliver oil received. Infants receiving codliver oil showed rickets that healed earlier than that of the control series. The nature of the relation of codliver oil therapy to the development of rickets, as observed in these studies, would seem to be one of control rather than of prevention.

In a comprehensive study by J. L. Gamble (Boston Med. and Surg. Jour., Sept. 8, 1927), he states that **codliver oil** prevents rickets with certainty in the majority of cases. The mild form can be made out only by X-ray examination of the skeleton. He refers to a marked diminution of severe rickets in his service since there had been a more widespread policy of giving codliver oil during the winter months. He deems it seldom necessary to use artificially produced **ultra-violet rays** for the prevention of rickets except in premature babies, as it can be prevented in the majority of cases by codliver oil and **sunshine**.

**TREATMENT.**—One of the leading French pediatricians, Marfan (Paris méd., Nov. 5, 1927), besides a carefully **regulated diet** and stimulation of the skin with **salt water baths** and **friction**, recommends **heliotherapy**, especially ultra-violet radiation, which he holds, modifies the nutrition of rachitic children. In his clinic the author uses the **mercury-vapor quartz lamp** of from 1200 to 2500 candle power to irradiate the



child, who lies naked on a bed, 50 cm. from the lamp at 1st, later 40 and 35 cm. The séance lasts at 1st 3 minutes for each side and later reaches 10 minutes for each side, given daily for 15 days. After a rest period of equal length, treatment is resumed. **Cod-liver oil** is deemed much less efficacious than the **ultra-violet rays**. Of calcium preparations, **tricalcium phosphate**, **calcium lactate** and **calcium formate** give the best results. With them may be combined **adrenalin**, which is said to fix the calcium in the tissues and in the bones. From 15 to 18 drops of the 1:1000 solution are administered *per os*, twice a day, before meals. This combination of adrenalin and calcium salts yields very good, if not better, results than codliver oil. **Phosphorus**, in solution in oil of sweet almonds or **codliver oil**, is especially useful when rickets is complicated by tetany. In this event, 1 to 3 teaspoonfuls of a 1:10,000 oily solution daily are prescribed. This solution is taken easily in milk. The bones are much more slowly affected by the treatment than is the general condition.

Gyorgy (Berl. klin. Woch., Apr. 23, 1926) succeeded in the treatment of rickets with **irradiated dried milk**. A similar observation has been recorded by Supplee and Dow (Amer. Jour. of Dis. of Childr., Sept., 1927) from the standpoint of laboratory studies, which tended to show that the nutritive and therapeutic properties of the product are enhanced to an appreciable degree. They state, however, that the beneficial results known to accrue to food products exposed to ultra-violet rays can be attained without measurable destruction of the readily oxidizable vitamins A and C,

provided that a suitable technic of irradiation is used. The comparative studies made indicate that the process of activation as applied does not accelerate oxidation of the fatty constituents to a degree that impairs the nutritive value or in any way induces changes of a detrimental character. On the whole, however, the question still requires considerable study.

Hess, Weinstock and Sherman (Jour. Amer. Med. Assoc., Jan. 1, 1927) found that **ultra-violet irradiation of a nursing woman** brought about a marked increase in the antirachitic potency of her milk. Fractionization of the milk showed that this effect was due to an augmentation in the antirachitic (non-saponifiable) factor. It is suggested that such irradiation be employed in order to protect infants from rickets and nursing women from excessive drain of calcium and phosphorus.

**RADIUM**.—F. D. John (Ill. Med. Jour., May, 1927) has used radium chloride in various disorders with gratifying results. Many of the cases had resisted other types of treatment but responded promptly to this therapy. He has not observed a single bad effect in any of them.

In the field of gynecology, considerable evidence of the value of radium is being accumulated. The complications following its application in **pelvic disorders** were studied by L. J. Stacy (Amer. Jour. of Roentgenol., xix, 323, 1928) in 361 cases at the Mayo Clinic. In 134 cases of **uterine carcinoma**, complications occurred in 24 cases (17.9 per cent.), including 1 case of pneumonia without signs of pelvic complication. In 10 cases the symptoms were of short duration and treatment was resumed after a few days. In 7 cases the treatment was discontinued owing to the patient's poor general condition or because of complications. Phlebitis occurred in 1 case and cystitis in 3 cases. In 23 cases of carcinoma of the fundus in which intra-

uterine radium treatment was given, 1 case of fever and phlebitis developed and treatment was abandoned after the 2d application.

Of 227 patients treated during 1926 for **menorrhagia** associated with a fibrous type of uterus or with uterine myoma, 5 had subsequent complications. In 1 case bleeding and pelvic pain continued and hysterectomy was performed 6 weeks later; in 1 case a pelvic abscess developed 6 weeks after treatment, in another case hemorrhage occurred 9 days after treatment, and in 2 cases there was evidence of pelvic cellulitis, the symptoms subsiding in 3 days and 3 weeks, respectively.

An important complication following the use of radium is recorded by Kane (Va. Med. Mthly., Aug., 1928). In 3 cases observed, after the use of radium, the indurated cervix formed an absolutely impassable barrier to the expulsion of the fetus. Two of the women became pregnant several years after the use of radium, proving that sterilization does not always result. In the 2d case, pregnancy was undoubtedly present when the radium was applied, which shows that radium is not always fatal to the fetus.

Andren (Acta radiol., Feb. 28, 1927) describes the technic employed in the treatment of 288 cases of **hemangioma**, 11 cases of **lymphangioma**, and 69 cases of epidermal **nevus**. Seventy-six cases of capillary, 138 of superficial cavernous, and 59 of deep cavernous hemangiomas were treated with radium and in a few cases with X-rays. As a rule, each dose was 80 per cent. of the erythema dose and the intervals were of considerable length. The hemangiomas were carefully watched between the treatments and the dose was not repeated until improvement had taken place. In treatment with X-rays, the dose generally was  $\frac{1}{4}$  of the erythema dose and a 4 mm. aluminum filter was used. In capillary hemangioma cosmetic restoration was obtained only in children under 1 year of age, and then only in cases where the size of the hemangioma did not exceed 10 by 35 mm. In more extensive hemangiomas the treatment did not lead to cosmetically satisfactory results. Of superficial cavernous hemangiomas, about 70 per cent. were cosmetically restored and about 30 per cent. improved. The caver-

nous hemangioma frequently grows rapidly during the 1st year of life and should, therefore, be treated during this time. Of 59 cases of deep cavernous hemangioma, cosmetic restoration was obtained in 28 and improvement in 17. Treatment with an extra lead filter 2 or 3 mm. thick brought about cosmetic restoration in 2 of 11 cases of cavernous lymphangioma. In 11 cases of nevus pigmentosus and 35 of pilose nevus pigmentosus cosmetic restoration was obtained when **electrocoagulation** was substituted for radium treatment.

Describing the employment of the screened radon seed in the treatment of **malignant disease**, Gosse and Chester-Williams (Lancet, Aug. 18, 1928) conclude that the initial response of malignant tumor is more rapid than that seen with other forms of radium therapy. The local reaction is brisk in some instances. This can probably be prevented by using more heavily screened seeds. Owing to the very small size of the seed in proportion to the dose of radium it contains, there is a tendency on the part of the surgeon to implant the seeds too close together, and this over-radiation may possibly account for the severe reaction occasionally met with. The use of seeds enables those tumors which, owing to their nature or position, are difficult to treat by other methods, to receive thorough radiation. The authors illustrate the power of radon seeds in various malignant conditions, including 1 of **sarcoma of the tonsil** in a woman of 73 years, treated in February, 1928. This patient had a firm, smooth swelling in the left tonsillar region, which had been noticed for 3 months. Six seeds were implanted. Three were recovered 14 days later and 3 remain permanently in the tissues. Existing condition (August 18, 1928): Tumor has entirely disappeared. Mucous membrane is intact.

#### RAYNAUD'S DISEASE.—

The pathogenesis of this disorder has been studied profitably from the standpoint of endocrin organs, notably the adrenals. In a case observed by Rud (Hospitalltid., Jan. 27, 1927), the patient, a man aged 26, had

suffered since childhood from vasomotor—trophic neurosis, which during the last year was manifested as typical Raynaud's disease. At the same time there were signs of suprarenal insufficiency and sexual impotence. The other endocrin organs did not show any abnormalities. The Wassermann reaction was negative and the Pirquet reaction positive after 48 hours. The hemoglobin was 103 per cent., and the erythrocytes numbered 5,170,000. The hands were pale and lead-colored, but, when warmed, changed to a bluish-red or red color. There was thickening of the skin of the fingers and the palms and a slight flexion contracture of the finger joints. The finger capillaries showed marked differences in dilatation during the syncopic and the asphyxial stages. The author attributes the disease to the sympathetic nervous system, specifically to adrenal insufficiency, and the case was treated accordingly.

Oppel (Arch. f. klin. Chir., cxlix, 301, 1928) regards Raynaud's disease as a *hyperadrenalinemia*. What produces the state of irritation in the sympathetic nervous system and what produces the artificial spasm in this disease have not, he thinks, been ascertained. Through the investigations of Ornatzky in spontaneous gangrene and of Achutin in Raynaud's disease, the presence of an excessive amount of adrenalin in the blood in these cases has been demonstrated by means of the Magnus test on isolated intestines of the cat. The writer concludes that the hematologic difference between Raynaud's disease and suprarenal arteriosclerosis is that in the latter a hyperthrombocytosis and a distribution of the calcium and

potassium electrolytes in favor of the potassium is demonstrable. But, since both of these diseases are produced by a hyperadrenalinemia, he considers that **adrenalectomy** is an etiologic method of treatment.

In opposition to this view, however, is the result of an examination by Grenet and Isaac-Georges (Bull. Soc. méd. des hôp. de Paris, Jan. 29, 1926) of the vessels in pieces of skin removed from the affected fingers of 3 patients with Raynaud's disease. There were lesions showing that mere vasoconstrictor spasm cannot induce gangrene, while *arteriolitis* may be the causative factor of the disease. Two of the patients were syphilitic; in the third case, the Raynaud's syndrome appeared after a mild infection.

Iwai and Meisai (Japan Med. World, Dec., 1926) hold that the disease is caused by an *autohemagglutinin*, and not by a neurosis of vasomotor nerves. This substance agglutinates the blood corpuscles and these occlude the vessels.

According to Borak (Zeit. f. d. ges. Neurol. u. Psych., Oct. 28, 1927), the pathogenic significance of the bone changes confirms the hypothesis that Raynaud's disease must be treated as a disorder of *spinal cord* origin. He believes that an increased activity of certain spinal cord centers is the cause of the disease. **X-ray treatment** of those portions of the **spinal cord** which supply the diseased extremities gave definite therapeutic results in 9 cases, 6 in the 2d stage, 3 in the 1st.

**TREATMENT.**—Bloch (Klin. Woch., Mar. 5, 1927) had an excellent results in 1 case from injections of extract of the **pituitary posterior**

lobe, given at 1st 2 days apart, and later at longer intervals.

Ronzini (Policlin., Nov. 21, 1927) observed a case of Raynaud's disease with gangrene of the foot in which **arsphenamine**, given intravenously, was followed by complete healing and subsidence of the pain. He holds that even in the absence of signs of syphilis it is worth while to try arsphenamine in such cases before resorting to the knife.

In 8 cases in which **ramisection** was resorted to, Royle (Med. Jour. of Australia, Nov. 5, 1927) states that 4 had been diagnosed as thromboangiitis obliterans; 4 were cases of typical Raynaud's disease. In thromboangiitis the result is satisfactory at first, but as the acute hyperemia wears off, there is often a return of pain, though the circulation of the limb is in a much more satisfactory condition than before the operation. In Raynaud's disease the results are much more successful and permanent. In all cases, except 1, it was located on the lower limb and the operation led to a complete relief of symptoms.

In a case of Raynaud's disease occurring in a man, aged 32, Mensing and Dieterle (Wisc. Med. Jour., Jan., 1927) resorted to **lumbar sympathectomy**. They excised the right and left lumbar sympathetic chain, including 4 ganglions. Some difficulty was encountered in mobilizing the vena cava on account of lateral branches, which had to be ligated. For the 1st time in 8 years the patient was entirely relieved of pain in the feet. Four weeks after the operation, the sensation of warmth had returned to both feet, and except for the very tips of some of the toes, the feet felt warm to palpation.

**RECTUM.—CANCER.**—Carcinoma of the rectum is a not entirely rare complication of pregnancy, according to Katz and Kaspar (Archiv f. Gynäk., Mar. 25, 1926). In some cases the development of the cancer seems to be in connection with the pregnancy, and there is recurrence of the tumor in the next pregnancy. This applies especially to women with a cancer heredity and with polyps of the rectum. The prognosis is comparatively good. The complaints of pregnant women as to rectal disturbances should always suggest an examination of the rectum.

In a case observed by Delrez (Liège Médical, Feb. 12, 1928) in a woman, aged 30, 6 months pregnant, suffering from carcinoma of the rectal ampulla, a left iliac anus was created. On the 15th day after the operation premature delivery occurred spontaneously. The child died the next day. About 5 weeks later, a vaginosacral amputation of the rectum was performed and a sacral anus made. After 16 months there was a recurrence in the substance of the intestinal wall of the sacral anus. This was incised and was demonstrated by histologic examination to be an adenocarcinoma. At present, 7½ years after the recurrence, the patient is well and shows no trace of further recurrence.

**TREATMENT.**—Carcinoma of the rectum, as well as all adenocarcinomas of the large intestine, has a worse reputation than it deserves, according to Schmieden (Münch. med. Woch., Nov. 25, 1927). The number of permanent cures that the modern (radical) operator can report is much larger than is generally believed. But these results are ob-



tained only when the entire organ, with the entire first layer of regional lymph glands and including all the connective tissue layers belonging thereto, is removed. The operation should not be undertaken by any surgeon who has not ample opportunity for practice in it. He advocates the abdominosacral, radical operation in 1 stage as the method of choice for patients able to withstand the large operation. He does not favor the preliminary establishment of an artificial anus as a routine measure. An advantage of the abdominal method lies in the possibility that it affords of palpating the liver for metastases before proceeding with the radical operation. He regards this as of great importance. If the hepatic metastases are small and it is certain that the radical operation can be easily performed, it may still be carried out. The advantage to the patient, though only temporary, will be considerable. Since the great majority of all carcinomas of the large intestine, including the rectum, originate in polypi, these growths should be sought for and included in the operation. This may necessitate the removal of the entire sigmoid flexure and of the entire gland-containing mesosigmoid, sometimes with segments of the bladder or uterus. Schmieden considers that the anxiety over the distress caused by an artificial anus is frequently exaggerated. With few exceptions, he finds complicated plastic operations unnecessary. The practitioner should endeavor to dissipate the specter of the artificial anus as known to the laity, since it often results in delaying the operation and even the preliminary examination. With the abdomino-

sacral operation, the high-seated rectal carcinoma is as operable as the low seated.

#### RESUSCITATION.—INTRACARDIAC INJECTION OF ADRENALIN.

—The case of a man aged 63, apparently moribund, who was resuscitated by an intracardiac injection of adrenalin was reported by Chalmers (Brit. Med. Jour., Dec. 25, 1927). The patient was admitted to the hospital with strangulated right inguinal hernia. Before he could be prepared for operation the pulse was lost at the wrist, he had Cheyne-Stokes breathing, and auscultation of the heart revealed no audible cardiac sounds. The man seemed to have passed rapidly into a moribund condition. An intracardiac injection of 10 minims of 1:1000 solution of **adrenalin chloride** was ordered, the injection being given in the 4th interspace. Before the needle could be withdrawn the heart was already beating vigorously, and the carotids were pulsating visibly. The man said he was comfortable and felt no pain. The operation was completed, and apart from retention of urine the day following, nothing further of note occurred.

Greene (Amer. Jour. Obstet. and Gynec., Aug., 1927) relates a case of chronic pelvic abscess in which a laparotomy was performed. During the latter, the heart stopped beating. The apex of the heart was seized through the unopened diaphragm, but no impulse could be felt. The **heart** was grasped between the thumb and fingers as high up on the organ as possible, and **rhythmically squeezed**. After 4 minutes of suspended animation, a faint cardiac contraction

was felt. This was followed by rapid trip-hammer-like throbs, weak at first, but gaining in force as the rate slowed down to rhythmic beats and the pulse was perceptible in the temporals. The patient was returned to the ward with a pulse rate of 140 and of fairly good volume and recovered.

**RINGWORM.—TRICHOPHYTOSIS.**—The treatment of cutaneous disease by **thallium acetate** has been advocated by several dermatologists, though the majority warn against the toxicity of the drug. Felden (Arch. of Derm. and Syphil., 17, 182, 1928) published a report of 47 children with trichophytosis of the scalp out of which 36 were cured after 1 administration of thallium acetate, of which 0.008 Gm. ( $\frac{1}{8}$  grain) per kilogram ( $2\frac{1}{2}$  pounds) of body weight was given by the mouth. Epilation started on the 18th day, being entirely spontaneous in only 50 per cent. of cases, and had to be completed by the extraction of loose hairs with adhesive strips. The local treatment consisted of painting the scalp with 5 per cent. **tincture of iodine**, and applying a 10 per cent. **sulphur ointment daily**, throughout the entire period, until the epilation was complete. It was found that patients with a marked discrepancy between weight and age were unfit for pure thallium treatment, and a combined method, consisting of  $\frac{1}{2}$  to  $\frac{2}{3}$  of the dosage of both the **X-rays** and **thallium** was recommended. The writer also states that thallium should be avoided in full dosage in adults and children approaching puberty, and that a repetition of the thallium intake in less than 2 months was

dangerous. It should be given on an empty stomach, dissolved in sugar-water, care being taken that no undissolved salt remain in the glass.

Dowling and Kelman (Lancet, Feb. 19, 1927) used **thallium acetate** for scalp ringworm in 24 cases. They give a single dose, 8 mgm. ( $\frac{1}{8}$  grain) per kilogram ( $2\frac{1}{2}$  pounds) of body weight, given by mouth in sweetened water. The hair begins to loosen in from 6 to 8 days, and complete epilation has taken place by the 19th day. Confinement to bed during the whole period of treatment is desirable. Albuminuria may appear as a complication; it should not be used, therefore, in the case of a person suffering from any renal disorder.

**ROCKY MOUNTAIN SPOTTED FEVER.**—This disease, according to Becker (Jour. Infect. Dis., July, 1926), exists in Colorado with an average annual incidence of over 2.57 cases and a mortality of 1.5 cases. It is widely spread throughout the mountainous regions of the states of Idaho and Montana. The disease in several patients and in guinea-pigs infected from these patients and from wood ticks, as observed in Colorado, differed from the typical Montana form, however, in the exhibition of marked gastrointestinal symptoms and lesions. Many micro-organisms, other than *D. rickettsi*, are found in local ticks. Certain symptoms of malaise, not typical of Rocky Mountain spotted fever, frequently follow tick bites in Colorado. Evidence supports the view that they are due to the tick bite, but are not a part of the characteristic clinical picture of Rocky Mountain spotted fever.

## S

**SALICYLATES.—PHYSIOLOGICAL ACTION.**—Grabfield and Knapp (Jour. Pharm. and Exper. Therap., Mar., 1928) found an increase of 10 per cent. in the total urinary nitrogen, total sulphur, total sulphate, and inorganic sulphate following the administration of salicylates—lithium, sodium and potassium—to physically normal persons on a weighed diet. The uric acid excretion was increased 30 per cent. The increase in nitrogen excretion occurred immediately after giving sodium salt, but was delayed 2 days when the potassium salt was used. The excretion of uric acid was most prompt after giving the lithium salt, and less prompt when sodium and potassium in the order named were administered.

Carnot and Coquoin (C. r. de la soc. de biol., Mar. 26, 1926) administered sodium salicylate to rabbits and guinea-pigs by the mouth and subcutaneously. The tendons, cartilage and aponeuroses seemed to have a special affinity for it. It seemed to accumulate in and around the joints.

**POISONING.**—In a man who died after drinking methyl salicylate (oil of wintergreen) Woodbury and Nicholls (Can. Med. Assoc. Jour., Feb., 1928) found that the only symptom was vomiting. The 2d patient was a child. It vomited and had convulsions. The autopsies showed acute degenerative parenchymatous nephritis, acute gastritis, intense congestion and edema of the lungs, and multiple small hemorrhages in the pericardial membrane, the pleura and subdurally. The convulsions and the paretic manifestations would appear to be explained by vascular disturbances in the cerebral cortex.

Meyer (Archiv f. Kinderheilk., July 17, 1926) observed 2 cases of poisoning by external application of an ointment containing salicylic acid. One of the patients was 9 months old, the other 8 years. The 1st sign of the poisoning was a dyspepsia. Fever followed, then a scarlatiniform rash.

**SALIVARY FISTULA.**—In a case reported by Chawla (Indian Med. Gaz., May, 1926), a limpid fluid was discharged from behind the left ear

whenever the patient took food. This condition had lasted for 13 years. Examination disclosed a tiny fistula, with its orifice about  $\frac{1}{2}$  inch behind the left ear. When the patient was asked to make the same movements with her jaw as if chewing food, no fluid escaped from the fistula; but the moment food was chewed, fluid commenced to run out of the fistula.

**SALPINGITIS.**—Referring to *tuberculous salpingitis*, Solomons and Lumsden (Irish Jour. Med. Sci., May, 1926) emphasize the fact that a young woman with pyrexia without any marked symptoms may be suffering from this disease, which is essentially curable.

In a series of 155 cases of salpingitis operated by Desmarest and Cvitanovitch (Gynéc. et obstét., June, 1927), only 7 (4 per cent.) were found in which the tube and ovary of the side opposite the lesion were intact. One of these 7 is described. They believe that *unilateral salpingitis* is much rarer than has been supposed. Generally, it appears under the form of a suppurative salpingitis or ovaritis, after a postabortal infection. In salpingitis of slow development, bilaterality is the rule. While the lesions of 1 side may be minimal in comparison with those of the other, bilateral lesions always exist. Tuberculous salpingitis is always bilateral.

**SCARLET FEVER.—SYMPTOMATOLOGY.**—In 74 cases Guitierrez and Garcia (Repert. de med. y cir. de Bogata, Oct., 1926)

studied the meaning of eosinophilia. Of the total cases, 44 were eliminated owing to the presence of intestinal parasites in the stools. In the remaining 30, eosinophilia appeared to be an index of the clinical course. In those cases in which it fluctuated between 6 and 12, recovery appeared to be the rule. Where, however, the symptomatology was more or less atypical, its disappearance or marked fall pointed to a fatal outcome.

According to Lindsay, Rice and Selinger (Va. Med. Mthly., Feb., 1927), the blood picture is characteristic of the disease, giving a marked leucocytosis and gradually increasing eosinophilia which may be of diagnostic value. The chemical examination of the blood during the acute stage of the disease usually shows a nitrogen retention which may be of value in determining the degree of toxicity of the disease, but does not aid in anticipating kidney changes. The presence or absence of immune bodies in the blood of any individual can be determined by means of the *Dick test*. The increase in antibodies produced can be measured by the same test. The presence of immune substances in the actively immunized can be made use of in the diagnosis of scarlet fever, *viz.*, the *rash extinction test* (*Schultz-Charlton reaction*).

In 132 cases tested by Blake (Lancet, Sept. 3, 1927) by the Schultz-Charlton reaction there was blanching in 97 (72.5 per cent.). Thus in 27.5 per cent. of cases of undoubted scarlet fever, blanching failed to occur with specific serums. But in considering these figures, it must be pointed out that in a number of cases only high dilutions were used. If only those patients are considered

who were injected with undiluted or 1 in 10 serum, the percentage of negative reaction falls to 22 per cent. Another factor to be borne in mind is the "age" of the rash. A rash that has been present 3 days is less likely to react than on its first appearance. All patients tested on the 4th day gave negative reaction, and it seems probable that the reaction can very rarely be obtained on or after the 4th day. The average interval before blanching occurred was 14½ hours, the shortest time being 6½ hours.

Hector (Arch. Dis. of Childr., Dec., 1926) observed 47 cases of scarlet fever with cardiac symptoms which showed that the almost invariable result of scarlet fever on a heart already injured by rheumatism is a rekindling of the old trouble which in some cases had been quiescent for a considerable period. A mild or moderate attack of scarlet fever is sufficient to bring this about. This may explain a case reported by Banks (Lancet, Nov. 5, 1927), in which the patient died before the rash had appeared.

According to McEntee (Brit. Jour. Child. Dis., Apr.-June, 1927), the *Dick test*, though helpful, is not alone a guide to diagnosis. The skin reaction is not proportional to the amount of toxin injected. This may indicate the widely different degrees of natural immunity or the extreme sensitivity of the test. A different and more accurate means of standardizing scarlatinal toxin must be devised.

Johan (Jour. of Immunol., Jan., 1927) holds that, when reading results of *Dick skin tests*, it is not enough to classify them merely as positive or negative reactions. Differences in



degrees of positive reactions must also be noted. There is not a sharp dividing line between positive and negative reactions; there are borderline reactions. The interpretation of these often depends on the physician who reads the reaction. When these borderline reactions are numerous, a larger possibility of error is introduced.

**COMPLICATIONS.**—In 2819 cases of scarlet fever analyzed by Barry (Lancet, Oct. 22, 1927), 303 developed *albuminuria* and *nephritis*, and in 69 rheumatism. Of these, 19 showed albuminuria. Thus the percentage of rheumatic patients having albuminuria was 27.5. Forty-six cases showed cardiac complications. In 4 albuminuria cases cardiac complications were present, and rheumatism was absent. Thus, albuminuria does not appear to increase cardiac complications, but the rheumatic cases showed them in 12. Of the first 100 patients treated with **alkalis**, 1 developed albuminuria and rheumatism, and 1 developed albuminuria while on the alkali treatment. The mixture given contained 40 grains (2.6 Gm.) of **potassium citrate** and 40 grains (2.6 Gm.) of **potassium bicarbonate** to each ounce (30 c.c.) of water. Alkalis lower the incidence of nephritis materially.

**ETIOLOGY.**—Deicher (Jahrb. f. Kinderheilk., Mar., 1926), in a comprehensive bacteriological research, confirmed completely the American work on the etiology of scarlet fever. Not every streptococcus obtained from scarlet fever produces a good toxin. He believes that it may be possible to identify these strains better by agglutination tests. Streptococci from other sources and some of the streptococci from scarlet fever

patients produce other toxins, which are not specific. While a convalescent from scarlet fever has a negative *Dick test* as a rule, he will react to these non-specific toxins. A convalescent child with a positive Dick test again became ill shortly afterward with scarlet fever. He rates the reliability of a negative Dick test at 98 per cent. The failures are partly due, he holds, to changes in the susceptibility in the same subject.

Zlatogoroff and Derkatch (Jour. Infect. Dis., Jan., 1928) studied toxins produced by 17 strains of scarlatinal streptococci and 13 of non-scarlatinal streptococci. The *Dick test* showed that 12 strains of scarlatinal streptococci out of 17 were toxic, while filtrates of these broth cultures diluted—2000 caused a positive skin reaction, and 5 proved slightly toxic. As to the 13 cultures of streptococci of other origin, 6 proved toxic, 4 showed a weak toxicity and 3 were atoxic. Using the scarlatinal streptococcic toxin on patients at the onset of scarlet fever, they obtained positive Dick reactions in 35.7 per cent. In the early convalescents there were positive reactions in 33.7 per cent. and in patients late in the disease there were positive reactions in 50.6 per cent. Non-scarlatinal streptococcic toxin used for the Dick test in patients who had freshly contracted the disease caused positive reactions in 12.5 per cent.; when used in early convalescents 20.8 per cent. gave positive reactions, and in patients late in the disease, positive reactions occurred in 44.6 per cent. The Dick reaction was positive in 19 of 23 cases of scarlet fever with lymphadenitis, in 6 of 17 cases with nephritis, and in 3 of 5 cases of scarlet

fever associated with otitis purulenta. Similar results were obtained with the non-scarlatinal streptococcic toxin. Substances producing the phenomenon of extinction (*Schultz-Charlton test*) were obtained by immunization with scarlatinal as well as non-scarlatinal streptococci. These observations do not tend to confirm the conception of the specificity of scarlet fever streptococci.

According to Tunncliffe (Jour. Infect. Dis., Oct., 1927), scarlatinal streptococci appear to lose their specificity through drying, according to opsonic tests. This characteristic seems to be stable for about 50 generations, after transference on to moist blood agar. The drying of streptococci may explain why streptococci isolated from walls and floors of rooms occupied by scarlet fever patients do not belong to the scarlatinal group of streptococci.

An investigation by Duval and Hibbard (Jour. Exper. Med., Aug. 1, 1927) supports their original contention that the toxic substance of the scarlatinal streptococcus is derived from the bacterial cell set free through the dissolution of the germ plasm. The liberation of the poison *in vitro* occurs as the natural result of autolysis, while *in vivo* it is produced through specific action of bacteriolysin.

Balmain (Lancet, Nov. 26, 1927) found that *Streptococcus scarlatinæ*, under experimental conditions, will survive on inoculated books and that it can be recovered from them during a period of 4 weeks. The number of streptococci was scanty after the 2d week from the time of inoculation.

Deicher (Zeitsch. f. Hyg. u. Infektsk., Oct. 24, 1927) is in accord

with the conclusions of investigators that the desquamation of scarlet fever convalescents does not contain streptococci. Hemolytic streptococci, however, can be found on the tonsils of all convalescents. Termination of quarantine, therefore, should be based on bacteriologic examination of the throat and tonsils rather than by cessation of desquamation. Scarlet fever streptococci may always easily be found on the walls of the sickroom and on the bedding.

**TREATMENT.**—Blake and Trask (Jour. Clin. Investig., Dec. 20, 1926), in a comprehensive research, ascertained that **scarlet fever antitoxin** should be administered as early as possible in the disease in order to check the toxemia during its period of increase. Patients with incipient septic processes early in the disease being potentially much sicker than those without septic processes, they should receive more antitoxin, even though they may not appear more severely ill at the moment. In the third place, it is evident that the largest amounts of antitoxin are required in cases presenting severe septic processes in which the rash is still bright. Finally, it is apparent that in late cases with faded rash, little, if any, benefit may reasonably be expected from antitoxin therapy.

The treatment of 100 cases of scarlet fever with a specific antitoxin caused in the hands of Doolittle (N. W. Med., Jan., 1927) an average return of temperature to normal (99 adults and 99.4 children for at least 2 consecutive days) in all patients in as short a time in treated as in untreated cases. There was an apparent lessening in complications among the treated as compared with the un-

treated cases. Two deaths occurred among the untreated cases and none among the treated cases. The time after the onset of the administration of the antitoxin influences both the course of the disease and the percentage of complications.

Eley (Amer. Jour. Dis. of Childr., Jan., 1928) found **antitoxin** of definite value in 215 cases. It is not indicated in all patients, as slightly sick patients do not receive enough benefit to warrant its use. Not only does the antitoxin cause the temperature to fall to 100° F. (37.7° C.) or below within 24 to 48 hours, but the entire clinical picture is changed. The rash faded more rapidly, the subjective symptoms disappear, and the patient feels improved. In those cases in which the patients do not improve after 48 hours, a second dose of antitoxin should be given. Extremely ill and toxic patients should be given the antitoxin either intravenously or intravenously and intramuscularly combined. Scarlet fever antitoxin decreases the number of complications.

**SCIATICA.**—Adels (Nederl. Tijdsch. v. Geneesk., May 22, 1926) in 13 cases of rebellious sciatica, used a 10 cm. needle, the patient prone, to reach the sciatic nerve. He then injected 2 c.c. of a weak **procaine-epinephrin solution**, repeating it in 1 week, and again 2 weeks later. The nerve is generally tender, which helps to locate it. All cases were cured. There was no recurrence since, the intervals reaching up to 10 years.

Gérard (Paris méd., Dec. 17, 1927) states that before treating sciatica the cause should be determined. If there is funiculitis or radiculitis,

**radiotherapy** should be used. If there is myalgia, **hydrotherapy** is the method of choice. For neuralgia, the **high frequency current** or **galvanization** are effective. The author recommends general **hydrotherapy** and **light baths** for patients with chronic rheumatism.

Jianu and Buzoianu (Lyon. chir., Nov.-Dec., 1927), in a study of **nerve grafts** or **heterografts of the sciatic**, found that the problem of nerve transplants was a complicated one, and so far as the surgical phase of it is concerned, is only partly solved. Experimental data demonstrate, however, the superiority of dead heterogeneous nerve transplants in the repair of considerable loss of substance in peripheral nerves.

**SCOLIOSIS.**—Klaften (Archiv f. Gynäk., Jan. 31, 1927) analyzed the course of pregnancy and parturition in 76 kyphoscoliotic women. In 61 delivery took place at term; spontaneous abortion occurred in 6; in 6 additional cases pregnancy was interrupted because of decompensation; labor was induced prematurely in 3; in 1 case supravaginal hysterectomy was performed. The onset of menstruation is likely to be retarded and other signs of ovarian hypofunction are common. The reason may lie in deficient blood supply due to interference with the circulation, caused by the structural deformity, or endocrin disturbances may be responsible for both conditions. The prognosis of pregnancy and labor depends largely on the condition of the lungs and heart. The heart requires special care. Most deaths take place late in the puerperium and are caused by bronchitis and pneumonia.

A new procedure in the treatment of severe scoliosis pointed out by Hendrix (Arch. franco-belges de Chir., Dec., 1926) consists of the use of a shell made by impregnating burlap with plaster, and reinforcing with rods. It is molded while the patient according to the directions of the orthopedist, is lying in the position most favorable to correction of the torsion of the spine. The patient spends a part of each day immobilized in this shell.

Lance (Gaz. des hôp., Mar. 26, 1928), whose experience is based on several hundred cases of scoliosis, states that **elevation of the heel** in scoliosis has been unduly slighted, partly because no definite rules for applying the procedure have as yet been laid down. He finds the measure of value in correcting of spinal deviations when due either to unequal length of the lower extremities or asymmetry of the sacrum or the 5th lumbar vertebra. It can be employed alone for straightening total flexible curvatures of the spine by creating a compensatory curve, or to restore spinal equilibrium in the lateral drops of the trunk which frequently precede the formation of curvatures. In scolioses with multiple curvatures elevation of the heel should be employed only as a measure auxiliary to the wearing of a rigid corset. Where this combination is availed of the **corset** must be made with the pelvis in the same tilted position as the raised heel will impart to it. The amount of elevation of the heel that can be borne without limping may reach  $2\frac{1}{2}$  to 3 centimetres. The elevation must be carried out in a gradual manner to avoid the child's walking with the knee

flexed, which would counteract the desired effect. Since some patients dislike to use a raised heel the difference between the 2 shoes should be disguised as much as possible by instituting the elevation in several different ways in the following order: (1) Wearing an extra heel 1 centimetre thick within the shoe; (2) raising the outer heel by 5 to 15 millimetres; (3) lowering the heel of the opposite side by 5 to 10 millimetres.

For the *prevention of scoliosis*, Hass (Wiener klin. Woch., May 27, 1926) begins with the infant. Too early sitting up and standing is dangerous. It is best to let the child creep. Carrying the child around is another cause of scoliosis. If the parents insist on it, they should not carry the child always on 1 arm. Flat mattresses in the school age are important. With beginning scoliosis, the children should lie on the concave side. Sitting all the time or carrying heavy loads at puberty should be avoided in order to prevent as much as practicable perpendicular intervertebral compression.

**SEA-SICKNESS, CAR-SICKNESS and AIR-SICKNESS.**—In reporting his results during a rough sea voyage, Elder (Med. Press, May 23, 1928) speaks very favorably of the following formula:

**R Strychnine**

sulph. .... gr.  $\frac{1}{32}$  (0.002 Gm.)  
Atropine sulph. . gr.  $\frac{1}{100}$  (0.00065 Gm.)  
Aqua destill. ... m̄v (0.3 c.c.)

administered hypodermically. The results are almost immediate and most gratifying. In several cases, 1 injection sufficed to quiet the patient enough to retain fluid in the stomach. Two injections at 6-hour intervals



was the average number given, while several cases received 3. If 3 failed, other measures were tried.

According to Bruns and Hörnicke (Münch. med. Woch., Jan. 27, 1928), the fact that at the height of seasickness there is a fall in blood-pressure and also that persons with high blood-pressure are rarely seasick suggests the administration of blood-pressure raising drugs. A combination of **atropine** and **strychnine** was found efficacious in such cases.

Bruns (Münch. med. Woch., June 11, 1926) recommends a meal and a **barbital sedative**  $\frac{1}{2}$  hour before the voyage begins. A **horizontal position** on deck near the center of the ship is advantageous and the stomach should contain some food all the time. Another dose of barbital may be given in 5 hours, and a 3d the next morning. If seasickness develops in spite of this, an injection of 1 mgm. ( $\frac{1}{65}$  grain) of **atropine sulphate** or a broad tight abdominal belt may help.

Pearcy and Hayden (Jour. Amer. Med. Assoc., Apr. 14, 1928) state that doses of from 0.2 to 0.3 Gm. (3 to 5 grains) of **sodium nitrite** every 2 hours relieved 8 persons of such symptoms as ocular nystagmus, vertigo, ataxia and nausea within 4 hours. Moreover, the patients did not suffer any recurrence of the symptoms. Sellheim (Jour. Amer. Med. Assoc., Apr. 28, 1928) also found that 1 minim (0.06 c.c.) of a 1 per cent. solution of **glyceryl trinitrate** (**nitroglycerin**), which has the physiologic action of nitrites, prevented seasickness. Seasickness was prevented or arrested by placing 2 drops of a 0.5 per cent. solution on the tongue.

### SEPTICEMIA.—ETIOLOGY.—

On investigating the cause of death of a mother and 2 infants and the serious infection of a third infant, all of whom were being cared for in a private hospital, Allan and Bryce (Med. Jour. Australia, 1, 390, 1928) found that the offending organism was in the nasopharynx of 1 of the attending nurses. After she had been relieved of duty no further cases occurred.

In a young woman who had been having recurring fever for 9 months, especially pronounced in the evening and night, the origin was traced by Bejarano Fuentes (Gaceta Med. de Caracas, Apr. 15, 1926) to an infected apparently sound tooth, removal of which was followed by complete recovery.

**TREATMENT.**—Horsley (Va. Med. Mthly, June, 1926) used **gentian violet** in doses varying from 3 to 7 mgm. ( $\frac{1}{20}$  to  $\frac{1}{9}$  grain) per kilo ( $2\frac{1}{2}$  pounds) of body weight, properly prepared 0.5 to 1 per cent. aqueous solution intravenously 51 times to 38 septic patients, with decided improvement in 21, and with 3 reactions. In cases of sepsis, in which Gram-positive staphylococci were the sole or predominant etiologic organism, and in which the lesions were accessible to the blood stream, the intravenous use of gentian violet was justifiable and often most beneficial. Doses from 3 to 5 mgm. ( $\frac{1}{20}$  to  $\frac{1}{12}$  grain) per kilo ( $2\frac{1}{2}$  pounds) of body weight, freshly prepared, 1 per cent. aqueous solution of **mercurochrome-220** soluble was given intravenously, with subsequent improvement in only 4 cases of sepsis out of 12 treated. Sepsis caused by Gram-negative organisms of the colon bacillus group

and by gonococcus showed most improvement in this series of 18 injections. Nine moderate and 2 severe reactions occurred. An absence of reaction was usually followed by no definite improvement.

Of 11 patients with generalized infection treated by Tenney and Lintz (Arch. Internal Med., Mar. 15, 1926) with intravenous injections of **neutral acriflavine**, 6 gave positive blood cultures. Of these, 5 died despite the treatment. The 6th case, 1 of typhoid fever, ran the usual course, and showed no shortening of the time necessary to procure negative stool cultures for release from quarantine. The authors have seen no improvement following the intravenous use of neutral acriflavine in cases of sepsis or bacteremia. There was spontaneous recovery in 2 cases of *Streptococcus hemolyticus* sepsis.

Giuffrè (Pediatria, Jan. 1, 1927) obtained good results in the treatment of septicemias with intravenous injections of doses as small as 0.05 c.c. of **streptococcus** or **staphylococcus vaccines**.

In non-diabetic septic subjects, Picard (Deut. med. Woch., June 24, 1927) invariably noted a high blood sugar level. This applied also to those having furuncles, phlegmons and abscesses. The highest glycemia observed in a non-diabetic patient was 215 mgm. per 100 c.c. of blood (phlegmon of the face). Daily injections of from 5 to 10 units of **insulin** proved beneficial. It caused recovery in several cases of furunculosis of long standing.

Lillie's clinical experience (Arch. Otolaryn., Jan., 1928) has shown that **blood transfusion** and the intravenous injection of **dye germicides** are

valuable supportive measures when used in conjunction with well directed **surgical intervention** in certain cases of general sepsis secondary to suppurative disease of the temporal bone.

**SERUM SICKNESS.**—In 35 patients who had reacted with an eruption to serotherapy de Lavergne (Bull. de la Soc. méd. des hôp., July 2, 1926) noted in 28 an enlargement of the thyroid gland, with enhanced activity, all of which disappeared with the effects of the reaction.

As stated by Spencer (N. J. Med. Soc. Jour., Jan., 1928), the present chief objection to **intravenous serotherapy** is the possibility of the occurrence of an acute anaphylactic reaction even before the injection is completed. A physician may give thousands of intravenous serum treatments with few or no consequences, but once he has experienced the clinical picture presented by the sudden collapse of a patient almost into, or actually into, death itself, he will hesitate long before inviting in any way a possible repetition of such an event. It is the shock type of reaction which leads even enthusiastic advocates of intravenous serum medication to admit that the slower routes of administration are preferable if satisfactory therapeutic results may thereby be attained.

Pignot (Médecine, Dec., 1926) describes measures capable of averting morbid phenomena after injections of a serum. Heated, preserved or purified serums may avert accidents after the 1st injection. In **subcutaneous** reinjections, 5 c.c. of the serum should first be introduced slowly; the total therapeutic dose is injected 15 minutes later. In **intraspinal** reinjec-

tions, 1st 1 c.c. of the serum is injected; the therapeutic dose, 2 hours later. It is well to have the reinjections preceded by an intramuscular injection of 0.005 c.c. of a 1:1000 solution of **epinephrine**. Bouchard's method is valuable in testing the patient's susceptibility toward a serum. One-tenth c.c. of the serum is injected subcutaneously into the forearm. In case of an existing hypersensitiveness, an intense local reaction is observed. Otherwise, the reaction is *nil*.

**SHOCK.**—Blalock (Arch. of Surg., Nov., 1927) suggests the following routine treatment of shock after any hemorrhage of significant magnitude. As soon as the hemorrhage is controlled, he should be given from 65 to 130 mgm. (1 to 2 grains) of **ephe-drine** subcutaneously. Intravenous **saline infusion** should be instituted as soon as possible, and relatively large amounts be given. Provided there is no structural cardiac disease or pre-existing hypertension of severe degree, and the patient is under 60 years of age, the heart will be able to take care of any reasonable amount of fluid added to the circulation. During the first hour, 1 liter (quart) of saline solution should be given intravenously. Thereafter, subcutaneous infusion should be employed until transfusion can be carried out. As soon as the saline infusion has been begun, the preliminary measures (procuring a donor and matching the blood) for transfusion should be instituted. If the patient's condition appears relieved, transfusion may not be necessary. If marked tachycardia persists, and more particularly if the systolic blood-pres-

sure is below 100 to 110, the transfusion should be performed. If, after the conclusion of transfusion, the patient's condition remains precarious, the whole process should be repeated. When the hemorrhage is from an internal organ and an operation is necessary, general anesthesia should not be used. Ether is dangerous. Clinical experience and experimental results agree in indicating that local anesthesia should be employed for operations on patients who have bled profusely.

To prevent surgical shock which, according to Anderson (Cal. and West. Med., July, 1927), is a sub-oxidation due principally to insufficient elaboration of insulin in the tissues with a resultant acidosis, he advises mouth administration of **dextrose**. Rosello and Benatti (Anales de la facul de med., May, 1926) in experiments on dogs, found that slight **rubbing of one of the adrenals**, the left preferably, since it is the most accessible, causes a sufficient amount of **adrenalin** secreted by the gland to represent a full dose of the latter.

**SINUSITIS.**—According to Jean (Amer. Jour. Dis. of Childr., July, 1926), sinus infection in children is of considerable importance as a focal infection. This is particularly the case in the production of cardiopathies, rheumatic fever, chorea, nephritis, pyelitis, certain cases of cyclic vomiting, deforming peri-arthritis, anemia, anorexia, malnutrition, chronic digestive disturbance, certain cases of neuritis, and possibly acrodynia. The gastro-intestinal tract may show symptoms of such severity that death results if the condition is not relieved. In several instances acute

mastoiditis existed though the local signs of this condition were relatively insignificant. Where mastoids were operated on, recovery followed and convalescence was rapid. He cites cases of chorea, nephritis, headache and asthma due to sinus disease.

Sinus disease is common in Gulf Coast children. During 1½ years McWilliams (So. Med. Jour., Aug., 1927) has seen 183 cases of sinus disease in them in which surgery became necessary in 80 instances, 80 per cent. occurring during the 3 winter months.

Swimming pools are frequent sources of sinus infection, according to Hasty (Trans. Amer. Med. Assoc., May, 1927).

**SODIUM.—SODIUM BICARBONATE.**—This salt is used extensively in many disorders, particularly in those of the digestive and respiratory systems. In a study of the effects of moderate doses upon the excretion of the acetone bodies Hubbard and Wright (Annals of Clin. Med., Apr., 1925) found that it actually increased their excretion. In infants, however, it may cause *toxic effects* of a serious nature. Morris (West. Va. Med. Jour., Mar., 1927) observed a case of ileocolitis, pertussis and bronchopneumonia in an infant aged 22 months. To combat acidosis and afford some nourishment a subcutaneous infusion of dextrose, 3 drams (12 c.c.) and sodium bicarbonate, 1½ drams (6 c.c.) was ordered, 500 c.c. (1 pint) being injected in 2 doses, 5½ hours apart. About 2 hours after the second injection, the baby manifested all the symptoms of tetany and died soon afterward.

**SODIUM BORATE.**—Birch (Brit. Med. Jour., Feb. 4, 1928) observed the case of an infant, 18 days old, who had consumed about 1½ drams (6 c.c.) of sodium borate and boric acid, in the form of honey of sodium borate and glycerin of borax (sodium borate, 1; glycerin, 6), administered to prevent thrush, on the advice of the nurse. The child died in coma.

**SODIUM NITRATE.**—Beecher and May (Berl. klin. Woch., July 2, 1926) were able to confirm experimentally the increased elimination of sodium chloride during a diuresis provoked by an injection of sodium nitrate. The chlorine and urea concentrations of the urine approach that of the serum. The chlorine concentration of the latter sinks during the diuresis. It remained unchanged in a nephrectomized animal. The main action of sodium nitrate was on the kidney.

**SODIUM CITRATE.**—Goia and Petri (Paris méd., Aug. 20, 1927) studied the hemostatic action of sodium citrate. When injected into the vein in doses of from 3 to 6 Gm. (45 grains to 1½ drams), this salt caused important modifications in the blood, which should be considered symptoms of shock, following on the occurrence of colloidal disequilibrium. The hemostasis is probably facilitated at the periphery by vasoconstriction and in the splanchnic region by concentration of thrombocytes and leukocytes. The increased coagulability of the blood appears in from 15 to 20 minutes.

**SPASMOPHILIA.**—In 3 cases in children from 5 months to 11 years of age, observed by Mendonca (Brazil-Medico, Feb. 27, 1926), *parathyroid insufficiency* and the consequent inability to retain calcium were unmistakably responsible for the disorder. There were no further manifestations of spasmophilia after the 2d day of **parathyroid** treatment. In 1 case with probable congenital syphilis, specific treatment had no effect until after the parathyroid treatment was under way.

Referring to the clinical diagnosis of spasmophilia, Wernstedt (Acta med. Scandin., Suppl. xvi, p. 253, 1926) insists that it had been produced in a fatal case described by the existing anomalies of the thymus and parathyroids. This is in keeping with the opinion generally held as to

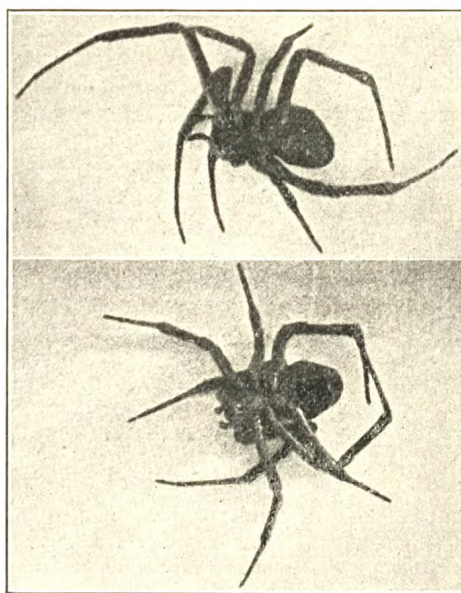


the endocrin origin of spasmophilia, and the author emphasizes the possibility that a hypoplasia of both glands coexisting in the same baby might provoke attacks of spasmophilia. Still, recalling that it is possible to remove the thymus *in toto* without producing symptoms of hyperexcitability, he concludes that, after all, the spasmophilia of newborn infants is really a parathyroid disease.

**SPIDER-BITES.**—According to E. Bogen (Jour. Amer. Med. Assoc., June 19, 1926, and Arch. Intern. Med., Nov., 1926), the so-called black widow, shoebutton spider, hourglass spider or T dot spider is probably the only poisonous spider in the United States. It is a shiny, coal-black spider, usually brilliantly marked with red or yellow or both. The female, always responsible for the bites, may have a spread of as much as 2 inches.

Aside from the acute, severe pain appearing  $\frac{1}{4}$  to  $\frac{1}{2}$  hour after the bite, reaching its height in less than 2 hours, not disappearing for several days, and sometimes leading to writhing, doubling up, and muscle spasms, the symptoms enumerated are, in the order of frequency, profuse cold perspiration, restlessness and anxiety, difficult breathing, nausea and anorexia, vomiting, constipation, cyanosis, delirium, prostration or shock, insomnia, disturbances of speech, acute urinary retention, paralysis, convulsions, swelling of the bitten part or other parts of the body, a macular skin eruption, chills, vertigo and jaundice. A board-like rigidity of the abdomen was the most striking physical finding. Tremors, twittings and paresthesias are pres-

ent in some cases. General weakness, numbness or tingling of the legs, or actual bodily pains, often remain throughout a long convalescence. In  $\frac{1}{2}$  of 15 cases analyzed by Bogen, the reflexes, especially the knee-jerk, were increased. Initial subnormal temperature followed by a mild fever was an almost constant feature. The pulse was below 66 for the first few days in over half the



"Black widow or shoe-button" spider (*Latrodectus mactans*). (Bogen from *Archives of Internal Medicine*.)

cases. The blood-pressure was always elevated, averaging 150 S. and 87 D., but dropped rapidly on later readings. Leukocytosis was present in almost every case, averaging 14,800 in the cases examined on the 1st day in the hospital, but dropping to 10,700 in cases examined several days later. There was generally a relative polymorphonuclear leukocytosis, averaging 80 per cent. A trace of albumin and a few hyaline or granular casts were found in the urine in

a number of cases, and blood in the urine in 1 case. Almost all the patients had obstinate constipation.

The differential diagnosis included infection following insect bite, an acute surgical abdominal condition such as ruptured gastric ulcer or acute appendicitis with peritonitis, renal colic, food poisoning, and lobar pneumonia.

Although a number of cases have been fatal, Bogen mentions no remote symptoms or results other than the "long convalescence" already alluded to. In a young white rat experimentally bitten by a black widow spider, Bogen observed an almost paralytic gait, humped back, sluggish behavior, and death in 2 days. Repeated injections of *macerated suspensions* of this species of spider, as well as solutions of the expressed poison glands, were made in rabbits, chickens, cats and white rats, without noticeable effect. There was no evidence of any hemolytic effect, either in the tissue extract or the suspension of the poison gland as tested against the blood corpuscles of rabbits, sheep and man.

**TREATMENT.**—More than 75 different remedies have been administered in spider bite. At the Los Angeles General Hospital (15 cases) the treatment has consisted mainly of (1) sedatives, such as **morphine** or **codeine**, **bromides**, **chloral hydrate**, **barbital** and **hot applications**; (2) stimulants, such as **aromatic spirit of ammonia**, **caffeine** and **strychnine**, and (3) eliminative measures, such as purgation with **magnesium citrate** or **sulphate**, **castor oil** or **calomel enemas**, **catheterization** and **gastric lavage**. Other sheet anchors in treatment (elsewhere) have been **whisky**

or **brandy**, **atropine**, **hot baths** and **fomentations**, **bleeding**, **camphor** and **potassium permanganate**.

Little is known, according to Bogen, about antibody formation to spider venom, but the experiments of Baerg and others indicate that one bite confers a degree of immunity. This suggested the therapeutic use of convalescent serum. At the Los Angeles Hospital, 20 c.c. of blood from a patient who had recovered from a severe poison spider bite inflicted 10 days before was injected intramuscularly to a man who had just entered the hospital in the agony of pain from a spider bite. Since he improved, the same procedure was followed in 3 later cases, in each instance with relief in a much shorter time than would otherwise have been expected.

Matus (Boll. de la Soc. de Cir. de Chile, May 25, 1927) relates the case of a girl who was bitten by a spider (*Mygales stephanis*) and developed a large necrotic area on the arm. The local character of the condition contrasted with the general and even fatal evolution of lesions from bites by *Latrodectus formidabilis*. The process seems rather common and local to Chile.

#### **SPINAL CORD.—DIAGNOSIS.**

—Referring to the **diagnostic use of iodized oil** (*lipiodol*) in the localization of spinal cord lesions, Armour (Lancet, Feb. 26, 1927) urges that it should not to any degree replace careful and repeated systematic clinical examinations of the patient, especially with reference to a sensory level, combined with laboratory tests of the cerebrospinal fluid. It should not be used unless the possible dangers and complications are outweighed by the more exact localiza-



tion likely to be obtained. Finally, in properly selected cases, iodized oil is a definite aid in the study of spinal cord compression, which, if used intelligently, will increase definitely successful removal of spinal cord tumors at an earlier stage in the course of the disease, and thereby increase the percentage of cures and reduce the operative mortality.

A simple method for the accurate determination of the upper level of lesions and tumors of the spinal cord is outlined by Fay (*Arch. Neurol. and Psych.*, Jan., 1928). In 13 verified cases the vasomotor line of demarcation has proved to be the most reliable sign; in each case it indicated the exact level of localization, corresponding with the history of the lesion, the zone of hyperalgesia corresponding exactly with the upper level of vasomotor demarcation. A point of tenderness to deep pressure was found in each case over the spinous processes at the level of the lesion. The vasomotor level indicates the root level for operative exploration and, in those cases coming to operation, has proven to be correct, even though the sensory tests in some would indicate a lower position of the lesion in the cord.

According to Sachs (*Mo. State Med. Assoc. Jour.*, June, 1926), every spinal lesion that shows a focal level has not been given a fair chance unless carefully explored. In 132 laminectomies, his mortality has been 12.7 per cent., minus 7 per cent. of these patients who died from their disease and not as a result of the operative procedure.

**TUMORS.**—Glass (*Amer. Jour. Med. Sci.*, Apr., 1926) observed a case of tumor of the spinal cord in which no

pain occurred. The neoplasm was an extradural endothelioma psammomatousum, lying external to the dura, and extending from between the 5th and 6th cervical vertebræ to between the 1st and 2d thoracic vertebræ, and lay both posterior and to the left of the cord. That part of the tumor which had grown about the left margin of the cord completely surrounded 3 nerve roots at their points of issuance from the dura. Neither spinal roots nor cord were particularly flattened.

**Cordotomy**, it may be recalled, is performed for the relief of pain caused by any organic lesion including cancer, the gastric crises of tabes, and other conditions which resist medical and surgical measures, other than the operation in point. Robinseau and Banzet (*Jour. de Chir.*, Aug., 1927) speak in the highest terms of this operation. The section is performed on the side opposite to that of the diseased organ, about 4 cord segments above the seat of pain. The effect of section of the anterolateral column is loss of pain and temperature senses. It is superior to resection of the posterior roots, because, unlike the latter, it does not affect the sense of touch nor the deeper senses, such as the sense of direction. When properly performed, the relief of pain is immediate and complete. Among the complications, they have noted urinary retention, urinary incontinence, urinary infection, trophic and motor disturbances. Muscular weakness of the extremities resulted frequently, but was not followed by contractures. In cachectic cancer cases the mortality from the operation was 25 per cent. In non-cancerous cases it was only 6

per cent. It may also be performed bilaterally under special indications.

**Laminectomy**, the older operation for spinal tumors and other non-traumatic spinal disorders, is resorted to with greater frequency since the introduction of myelography. Wieden (Beitr. z. klin. Chir., 143, 121, 1928) in tabulating the cases operated upon at the Schloffer Clinic during the last 13 years for symptoms of spinal compression, states that in the 31 cases there were 18 true tumors, 2 tuberculous granulation tumors, 1 adhesion of inflammatory nature in tuberculous spondylitis, and 2 cases showing the typical picture of a meningitis serosa cystica. In 1 instance only adhesions of the caudal fibers were found. In another these were found in a spina bifida occulta. In 2 patients laminectomy was resorted to for suppurative metastases in the spinal cord and in the vertebræ. Fourteen of the tumors were extramedullary (10 of these being benign), 2 were intramedullary, and 2 were metastatic.

Although the initial symptoms varied quite considerably the radicular symptoms were, with few exceptions, predominant in tumors of the spinal cord. Benign intradural extramedullary tumors came to operation earlier than the malignant intradural extramedullary tumors. The diagnosis of the level of the tumor was made correctly in 16 out of 18 cases. Of the 34 laminectomies 8 were done under anesthesia. In only 8 of the 26 operations done under local anesthesia was it necessary to add inhalation anesthesia.

For the operation of laminectomy the patient lies in the prone position. The opening is made in the usual

way, the approach being made as wide as possible. No packing is used and the layers of the wound are closed in tiers. No spinal fluid fistula ever resulted. Recovery followed in 72 per cent. of his cases and in the extramedullary tumors alone, it followed in 86 per cent. of the cases. The mortality was 3.2 per cent.

**X-rays.**—Ledoux-Lebard and Piot (Presse médicale, Apr. 13, 1927) extol the use of X-rays in the diagnosis and treatment of spinal tumors. The X-ray examination preceded by injection of lipiodol, enables one to locate exactly the seat of the tumor; after operation X-rays are used to complete the cure. The field of irradiation should exceed the limits of the region of operation. From 500 to 1000 Behnken units of deeply penetrating X-rays are applied at each exposure, repeated at 1 or 2 day intervals for 3 or 4 weeks. A second series of exposures may be given after a 3 months' rest. With this method complications have never been observed. In 3 patients with *sarcoma*, *lymphosarcoma* and *glioma*, respectively, **operation** and **roentgenotherapy** brought about recovery. In 1 of the cases the clinical cure is already of 3 years' standing.

**SPINE. — DIAGNOSIS. — IODIZED OIL OR LIPIODOL.**—Marque (Archivos Latino-Amer. de pediat., Apr., 1926) used lipiodol in 6 spinal cases in children and found it free of by-effects. In a girl, aged 10, 3 injections of the iodized oil had been given; they made it possible to remove the contents of a costovertebral abscess compressing the spinal cord, with almost complete recuperation of function. Sharpe and Peter-



son (Jour. Bone and Joint Surg., Apr., 1926), however, found that the presence of lipiodol in the spinal theca could cause aggravation of clinical symptoms and signs. They urge caution regarding its use, especially as an early method of diagnosis. The fact that it is apparently non-absorbable they deem in itself a potential danger.

**BACK INJURIES IN WORKMEN.**—Herndon (Jour. Bone and Joint Surg., Apr., 1927) conducted a study of 941 consecutive cases of back injuries in industrial employees. Sprain occurred in 498 cases. About  $\frac{2}{3}$  of the cases were located in the lumbosacral region. In about 11 per cent. the condition seemed to be localized about the region of the sacro-iliac joint. The next most frequent site was the middle and upper lumbar regions, where about  $\frac{1}{4}$  of the cases occurred. Contusions occurred in 122 cases, and fractures of the vertebral processes in 41 cases. In 36 cases the fracture involved 1 or more of the transverse processes. In about  $\frac{1}{2}$  of these it was due to abnormal muscular pull, and in about  $\frac{1}{2}$  to direct violence. Fracture of the vertebral bodies occurred in 30 cases, or 3 per cent. Many of these followed what seemed to be slight accidents, and were surprisingly devoid of symptoms. Chronic deforming arthritis was found in 107 cases. A neurosis was diagnosed in 11 cases. Malingering occurred in 35 cases. In 97, the condition of the back and the symptoms complained of seemed entirely attributable to disease. Variations in the spine from the normal anatomy occurred in 4.8 per cent. of the lumbosacral cases. The most common injuries were split spinous processes,

usually of the 1st sacral vertebra, and sacralization of the 5th lumbar vertebra.

**SPINAL TUMORS.**—Elsberg (Surg., Gynec. and Obstet., Jan., 1928) analyzed 179 spinal tumors. The meningeal and perineurial fibroblastomas formed a large proportion of the tumors inside the dural sac, but they were much less frequent outside of that membrane (82 per cent. of intradural and 17 per cent. of extradural growths), while the sarcomas and chondromas, which formed 61 per cent. of the extradural tumors, were comparatively rare inside of the dura, 6 per cent. of the intradural extramedullary growths being classified as sarcomas.

**TUBERCULOSIS.**—Sorrel and Sorrel-Déjerine (Presse méd., June 23, 1926) identified 3 forms of paraplegia from Pott's disease, 2 of which are curable. The curable may be transitory and disappear in a few weeks or months, or it may persist for  $1\frac{1}{2}$  or 3 years, but the transient form occurs rarely. The curable forms appear at an early stage of tuberculous spondylitis, the development of the paraplegia being rapid and complete. The clinical picture seems to be grave. Nevertheless, the paralysis disappears, without any sequelæ. The incurable paraplegia is a tardy complication; it develops slowly; the sensibility and sphincters are not affected in the beginning. The curable forms are observed in adults as well as in children. They are induced by intraspinal abscesses, while the incurable form is due to external pachymeningitis.

In 45 cases of tuberculosis of the spine treated by Haslitt (U. S. Veterans' Bureau Med. Bull., Aug., 1926) by **plaster-of-paris jackets**, all improved rapidly and progressed

right along into inactivity with the exception of 2. The average time for ankylosis and inactivity was about 18 months. The majority of cases had a pulmonary lesion in connection with the spine. The chest condition improved after from 6 to 9 months of the jacket treatment.

The Delagénières (Arch. franco-belges de Chir., Jan., 1926) employed **bone-periosteum implants** in 3 adults with tuberculous spondylitis. The induced ankylosis of the posterior vertebral arches soon restored the earning capacity. Paraplegia, cold abscess, excessive pain are indications for such interventions. Their bone-periosteum technique has the advantage over the Albee method that solid bone develops, reënforcing the spine.

Lange (Surg., Gynec. and Obstet., May, 1927) uses a **rust-proof steel splint** placed on 1 side of the spinal column with a celluloid splint on the other. These splints are fixed with thin steel wire of the rust-proof variety instead of silk. The advantage of steel is that it has greater stability than celluloid. A 3 to 4 mm. steel splint would compare quite favorably with a 10 mm. celluloid splint.

**SPLEEN.—DISEASES OF.—BANTI'S DISEASE OR SPLENIC ANEMIA.**—Rolleston gives the following criteria for the clinical diagnosis of Banti's disease in the early stages: (a) chronic splenomegaly or enlargement of the spleen with no apparent cause; (b) no enlargement of the lymph glands; (c) anemia of chlorotic type; (d) copious gastro-intestinal hemorrhages; (e) prolonged course. These conditions with the exception of the gastro-intestinal

manifestations were fulfilled in a case reported by E. C. Smith (Irish Jour. Med. Sci., Mar., 1924). Microscopic appearances resembled closely the descriptions given by Banti. The interesting feature was the appearance of the malpighian bodies and larger areas of hyperplasia. The condition seemed to represent an early stage in the reaction of the malpighian bodies to the disease, a condition which would have resulted ultimately in fibrosis, and be an early stage of the disease, of infectious origin. This interpretation was also sustained in 5 cases studied by Nanta, Pinoy and Grunz (C. r. de la Soc. de biol., Mar. 19, 1926), whose histologic and bacteriologic examination revealed in the spleen tissue considerable granulomatous degeneration, and only slight sclerosis, contrary to what is usually noted in Banti's disease. The microscope showed a large spirochete and a streptobacillus of the myxobacteria type. Inoculation proved positive in 2 guinea-pigs. It is still uncertain, however, whether the 2 micro-organisms or either one of them causes the disease.

**GAUCHER'S DISEASE.**—Oberling and Woringer (Revue Franç. de pédiat., Aug., 1927) add 4 personal cases to the 6 cases of this disease occurring in infancy. There was great enlargement of the spleen and a nervous syndrome characterized by a diminution of psychic functions, muscular hypertonia and increased reflexes. The head was held in forced extension and the body in opisthotonos. The anemia, hemorrhagic diathesis and abnormal pigmentation of the skin encountered almost uniformly in the adult and in the older child, are almost lacking in the in-

fant. In a few months, complete idiocy, decerebrate rigidity and extreme cachexia develop. Death occurred before the end of the 1st year of life. The disease is familial but not hereditary. Puncture of the spleen is indispensable for diagnosis during life. It reveals the existence of the Gaucher cell.

**SPLENOMEGALY.**—Splenic enlargement may be caused by many disorders. This is well illustrated by an investigation recorded by Aballi (Vida Nueva, Dec. 15, 1927), though it must be borne in mind that the tropics, Cuba in the present instance, predispose to this condition. Among 7200 children, 470 had an enlarged spleen. The writer found that the most common causal factors were: syphilis, 170; tuberculosis, 34; malaria, 30; intestinal parasites, 30; celiac disease, 12; typhoid, 11. Yet anemia and hemolytic jaundice are not very common in Cuba. In most of the 11 cases of von Jaksch's anemia, syphilis was a factor. Among so-called pseudoleukemias, the most common in Cuba is Hodgkin's disease; lymphosarcoma comes next and aleukemic lymphomatosis last.

**MYCOTIC SPLENOMEGALY.**—This disease, according to Weil, Grégoire and Flandrin (Presse méd., July 16, 1927), constitutes a veritable clinical entity, the etiology and pathogenesis of which are still unsettled. It seems to be the most frequent of the primary splenomegalies. It consists of a splenic enlargement alone or with digestive tract hemorrhages, jaundice, anemia or with polycythemia, ascites and cirrhotic lesions of the liver, *i.e.*, with all the symptoms of primary splenomegaly. The diagnosis of these mycotic spleno-

megalies, which is anatomically and microscopically easy, can be made clinically only by elimination of splenic lesions of recognizable etiology.

The treatment consists essentially of **splenectomy** as early as possible before the setting in of complications, which bring on general deterioration and a fatal issue. In an enlarged mycotic spleen if recognized early, **potassium iodide** in large doses (from 4 to 8 Gm.—1 to 2 drams—per day) may be tried.

**SPRUE.**—The blood calcium of this disease has received increased attention. According to Ashford and Hernández (Amer. Jour. Med. Sci., Apr., 1926), however, low total serum calcium values are not pathognomonic of sprue, or of any other special disease they have so far seen. They are probably the indirect results of nutritional imbalance. The marasmus of sprue is notorious. No disease furnishes a higher percentage of "living skeletons," but in more than  $\frac{1}{2}$  of the severe and cachectic cases there is a normal total serum calcium. There seems to be, as a rule, a real and positive rise in serum calcium after the intramuscular injection of **parathyroid extract**. This rise must be only temporary, however, as may be faintly shadowed by the disparity between rises after a month and those after a day or so following injection. On the other hand, some old cases of sprue have attained a normal calcium with **diet** alone, even with **monilia vaccines** alone, but always only in conjunction with improved nutrition and digestion with restoration of digestive glandular efficiency. Of the 101 cases of nutritional unbalance reported by the authors, cultures were

made from the feces in 38 cases and 2 were positive for *Monilia psilosis*, while of the 55 cases of sprue, 35 were positive for *Monilia psilosis*. Thirteen are as yet unclassified but positive for *Monilia* of doubtful species, and 6 are negative for all fungi. The feces of 178 supposedly healthy boys were cultured and in 7 *Monilia psilosis* was found.

In 3 cases of rather severe sprue described by Baumgartner (Amer. Jour. Trop. Med., May, 1927), with blood calcium studied, a comparison of **calcium lactate** and parathyroid therapy, diets and blood picture, indicated that the **dry extract of parathyroid** is not as impotent as has been maintained by some, and that it may even be dangerous as a therapeutic measure if carried out over a long period.

**STERILITY.**—The familiar influence of the thyroid gland upon fertilization has suggested a relationship with basal metabolism. Litzenberg (Amer. Jour. Obstet. and Gynec., Nov., 1926) found that of 69 consecutive cases of sterile women upon whom the basal metabolism rate was determined, 44 came seeking relief for sterility. The remaining 25 were found during the course of a complete physical examination to have a low basal rate and were sterile, but sterility was not the primary reason for their coming for examination. Of the 44 seeking relief from sterility, 22 had a basal metabolic rate of minus 10 or below. The author concludes that properly supervised thyroid medication will restore the basal metabolic rate to normal and in some cases result in conception. He deems it injudicious to give thyroid to any

case of sterility unless the basal metabolic rate justified its use. Furthermore the rate must be controlled from time to time so that the medication can be regulated.

Various experimental studies have clearly shown that sterility was caused by a deficient diet—a hint to those women who, in order to reduce any abnormal size they may deem “out of style,” decrease their food intake to very harmful limits. Conversely, however, it is important to bear in mind that obesity is a prolific cause of sterility. Dickinson and Cary (Jour. Amer. Med. Assoc., Jan. 1, 1927) recall the investigations of Kisch, who found, among 215 women with excessive adiposity,  $\frac{3}{4}$  with menses scanty or absent, and 21 per cent. sterile. He refers to 2 fertile women who ceased bearing after laying on weight, and 3 who became pregnant on taking off weight. Many investigated the beneficial effects of **thyroid gland with pituitary whole gland** in these cases. Especially is this treatment applicable where the basal metabolism is found below normal, as stated above.

The treatment of sterility, however, is not a simple affair readily overcome by medical or endocrine treatment, its causes, functional and organic, being very numerous. These once looked into and corrected, if need be and where possible, endocrine therapy furnishes the principal method of treatment, as stated by Pouget (Clin. Med., Aug., 1926), under the following conditions: Polyglandular therapy: **Ovarian and thyroid** substances when the syndrome of myxedema exists concurrently; **ovarian and pituitary** substances in general infantilism or adiposogenital



dystrophy; or **ovarian hormone** therapy alone when the ovary exhibits aplasia or primary hypofunction. This method of treatment should be supplemented by **alkaline douches** with a view of neutralizing vaginal acidity which is detrimental to the vitality of the spermatozoa.

The *Rubin per-uterine tubal insufflation test* introduced in 1920 (Trans. Amer. Med. Assoc., May, 1927) has been aided by the addition of a kymograph attachment which records the pressure required for the carbon dioxide, or any other gas employed, to pass through the uterine opening of the tubes and out through the abdominal end into the peritoneal cavity. This combination has made possible the determination of the behavior of normal tubes as distinguished from pathologic tubes. The fluctuations of the manometer as recorded on the kymograph indicate the reaction of the tube muscle to the gas. Spasm of the tubes can thus be distinguished from incomplete stricture as well as from complete occlusion of the tubes and the resulting sterility. The pressure fluctuations are in all probability due to tubal peristalsis, proof of which has been afforded by experiments on the surviving uterus and tubes as well as on animals.

The widespread application of the Rubin test in Argentina is emphasized by Berri (Semana medica, Apr. 1, 1926), who states that it has been often applied in his service in the last 4 years, with Rubin's technique. With impermeable tubes, he repeats the test 2 or 3 times, sometimes finding the previously impermeable tube freely patent at the later test. One woman with dysmenorrhea and impermeable tubes at the 1st test was

found clinically normal later; the dysmenorrhea disappeared on repetition of the per-tubation, rendering impregnation possible.

#### STOMACH.—PHYSIOLOGY.

—The response of the normal stomach to foods was studied by Hawk, Rehfuess and Bergeim (Amer. Jour. Med. Sci., Mar., 1926). They found that there is a certain characteristic response of the stomach for each variety of foodstuff, and that the normal stomach could satisfactorily handle a great variety of foods. The digestion of raw vegetables was found much more of a mechanical procedure than in the case of meats. Experimentally at least, it became apparent that functional diseases almost always resulted in either a delay in evacuation or in a rise in the acid secretion or, again, in a failure of the stomach to react rapidly to the food.

Molnár and Sereghy (Archiv. f. Verdauungskr., Dec., 1927) found that 10 Gm. ( $2\frac{1}{2}$  drams) of fresh butter stirred into 80 Gm. ( $2\frac{2}{3}$  ounces) of peas porridge greatly prolonged the stay of the latter in the stomach. Ten grams ( $2\frac{1}{2}$  drams) of wheat flour browned in 10 Gm. ( $2\frac{1}{2}$  drams) of lard and added to 70 Gm. ( $2\frac{1}{3}$  ounces) of peas porridge prolonged it still further.

According to Rogers and Martin (Amer. Jour. Physiol., Apr., 1926), the Type I hunger contractions of Carlson's classification are essentially strong circular contractions of the lower half of the stomach, involving particularly a band of muscle near the junction of the middle and lower thirds of the stomach. This type of hunger contraction may or may not be associated with active peristalsis.

Type III contractions consist of active peristaltic waves running over a hypertonic stomach. When hunger pain occurs, the characteristic feature appears to be, as shown by X-ray examination, according to Martin and Rogers (Amer. Jour. Roentgenol. and Radium Therapy, Feb., 1927), a complete circular constriction in the lower third of the stomach. Contractions of the upper stomach may or may not occur simultaneously with this antral contraction. During the period of incomplete gastric tetanus there occur circular contractions of the antrum, a general shortening of the stomach and a wave distribution suggesting peristaltic activity at times. Rhythmic changes in the fundus, described by certain physiologists as the cause of the tonus changes, were not observed.

**ACIDITY OF THE GASTRIC JUICE.**—Bloomfield and Keefer (Jour. Clin. Investig., Feb. 20, 1928) studied the acidity of the undiluted gastric juice after a constant stimulus in patients in whom no organic disease of the stomach was present, indicating that as people grow older, they tend to secrete a less acid gastric juice. The importance of this observation lies in the fact recorded by Hartman and Sager (Med. Jour. and Rec., July 21, 1926) that carcinoma is rare when free hydrochloric acid is present.

Sager and Hartman (*Ibid.*, Aug. 4, 1926), in an analysis of 420 cases in which hypo-acidity was present, all other factors being disregarded, 158 were of functional nervous disease. There were 67 cases of cholecystitis; 17 of unquestioned cancer; 28 of peptic ulcer; 18 of chronic constipation; 11 of appendicitis, and 13 of syphilis. No cases of pernicious anemia were

found. The remaining cases were probably only accidental, having no relationship to the hypo-acidity other than as a coincidence.

The importance of the salivary secretion is emphasized by various facts. Delhougne (Klin. Woch., Dec. 24, 1926) found a low ptyalin content in the saliva of patients with sub-acidity of the gastric fluid. Demel (Arch. f. klin. Chir., Oct. 18, 1926) found that, in the dog, removal of the various salivary glands resulted in retardation of the healing of wounds of the gastric mucosa. He found, furthermore, that the saliva of ulcer patients was more strongly alkaline than that of healthy persons. The diastatic action of the saliva of ulcer patients is in general weak. For ulcer patients the increase in rhodan suggests, therapeutically, the advisability of forbidding tobacco and meat, particularly meat broths. Alkalis of various sorts should be given in abundance. Diastase preparations may be used to offset the lowered ptyalin action of the saliva.

No fast rule can be established, however, concerning gastric acidity in its relation to gastric disorders. Escudero (Semana méd., Jan. 7, 1926), for instance, found the gastric contents apparently normal in various forms of functional or organic derangement. In 401 stomach patients examined, hypoacidity was found in 54.4 per cent. of the 248 cases of functional dyspepsia and in 52.2 per cent. of the 153 with organic disease; normal acidity was found in 29 and 24.1 per cent. respectively, and hyperacidity in 16.5 and 23.5 per cent. Repeating the analysis gave conflicting findings in 30 per cent. of the cases studied.

**Treatment.**—Dobson (Jour. Pharm. and Exper. Therap., Apr., 1927) studied the effects of the combined use of **pepsin** and **hydrochloric acid** upon hypoacidity or achlorhydria by fractional meal tests. A few days after their use had been started there were evidences that secretion had increased, and after 13 days that free hydrochloric acid and pepsin in fair concentration were found in the stomach spontaneously after a test meal. The dosage necessary to maintain free acid in normal concentration in the stomach throughout digestion was dependent on the composition of the meal, especially from the standpoint of protein. For a simple carbohydrate test meal, free acidity could be maintained in normal concentration with adequate dosage at sufficiently frequent intervals during digestion. There was evidence suggesting that free hydrochloric acid not only regulated the activity of the pepsin but also influenced its secretion.

Kern, Rose and Austin (Jour. Clin. Investig., Aug. 20, 1926) found doses of from 4 to 8 c.c. (1 to 2 drams) of **dilute hydrochloric acid** practicable, adequate and preferable to the usual dose of 1 c.c. (16 minims). In 2 cases of primary pernicious anemia, remissions of 9 and 12 months have co-existed with the continued administration of dilute hydrochloric acid in doses of 4 c.c. (1 dram).

Where, conversely, *gastric hypersecretion* exists, some of the present methods of treatment, notably by milk, require revision. Rasoumov and Levina (Arch. des mal. de l'app. digestif, etc., Dec., 1927) conducted an analytic study of this question in a series of patients. The stomach's capacity of adaptation to different

foods was established by comparing the secretion after a *Ewald test meal* (using the stomach tube) and after a *fluid starch meal* (Einhorn's tube). A normal ratio of general acidity in the second instance to the same acidity in the first instance should always be below  $\frac{1}{3}$ . In cases of hypersecretion in which the stomach's capacity of adaptation to different foods is lost, there was no particular sensitiveness to milk. On the other hand, there was sensitiveness in cases of hypersecretion in which the capacity of adaptation was preserved. The contraindication to milk in the diet in these latter cases, however, was based not only on the unfavorable combination of fat and albumin, but also on the fact that milk contains vagotropic substances. The results of these experiences furnish a new basis for the **exclusion of milk** from the diet of persons with hypersecretion.

**DILATATION.**—Hypersensitiveness over the solar plexus when the patient is standing, accompanies gastric dilatation, according to Leven (Presse méd., Apr. 9, 1927). The pain, called by the author "*signal pain*," disappears in the prone position, when the stomach is displaced downward. The diagnosis of dilatation cannot be definitely established unless the reflex orthostatic symptoms are explored. The results of examination for the "pain signal" were always confirmed by roentgenograms. These results are more important than the classic clapotage symptom. The latter may be absent in excessive dilatation, or it may occur in aërophagy without dilatation. Placing the patient in an appropriate position is a method of treatment.

In a case of acute dilatation observed by Snell and Savin (*Lancet*, Aug. 7, 1926) the splashing sound could be heard at a distance of 12 feet and was synchronous with the heart beat. The stomach was enormously distended, reaching below the umbilicus and far into both flanks, and appeared to contain gas and fluid. Deep palpation revealed that the succussion splashes were being caused by a forcibly pulsating aorta, every beat of which drove the stomach against the anterior abdominal wall. This impact was visible. Rolling the patient on his side or prone immediately stopped the splashes; but they recurred at once on putting him on his back.

**Treatment.**—The importance of distinguishing gastropsis from other duodenal disturbances is emphasized by de Luna (*Marseilles méd.*, Aug. 15, 1926), as its treatment is very different from that of the others. It is essentially medical, the **horizontal position**, the wearing of a **supporting girdle**, **exercise** of the **abdominal muscles**, and **fractioned meals** with special regard to the ptosis. Systematic weighings show the course of the case. When the duodenum also sags, the symptoms usually include digestive disturbances, migraine terminating in diarrhea. There may also be pain in the gall-bladder and vomiting of bile; subjaundice has been observed in a few instances.

**BENIGN TUMORS.**—Balfour and Henderson (*Annals of Surg.*, Mar., 1927) reviewed 58 cases of benign gastric tumors. Of these, 57 had been removed, 36 showing that the benign growth was the only one present. In 17 **excision** was resorted to, while in the remainder (except in the case

of exploration), the segment of the stomach containing the tumor was **resected**. The situation of the tumor determined the best method of approach. The procedure used most frequently was transgastric excision through an incision in the anterior wall, and division of the pedicle by the cautery. In the uncomplicated benign tumors there was no operative mortality.

**MALIGNANT TUMORS.**—Hartman (*Surg., Gynec. and Obstet.*, Mar., 1927) observed a case of multiple neurofibromatosis associated with an intra-abdominal sarcoma which presumably had arisen in the neurofibroma of the stomach wall. The presence of a rapidly growing intra-abdominal tumor associated with von Recklinghausen's disease should suggest the possibility of sarcomatous degeneration of a previously benign neurofibroma.

In a case observed by Hall (*Brit. Med. Jour.*, Mar. 10, 1928), the clinical evidence had suggested a diagnosis of duodenal ulcer. Under general anesthesia a movable epigastric tumor, about 4 inches (10 cm.) in diameter, was felt through the abdominal wall and explored through a right paramedian incision. It proved to be a growth of the middle of the stomach, slightly adherent to the pancreas, with multiple glands in the gastro-hepatic and gastrocolic omenta. The growth was removed with the enlarged glands and a small portion of pancreas by the **modified polya method**, leaving about  $\frac{1}{4}$  of the cardiac end of the stomach to anastomose to the side of the jejunum. Convalescence was uneventful. The microscopic diagnosis was small round cell sarcoma which had become ul-



cerated. Four months later the patient gained in weight and all signs of the malignant condition had disappeared.

Djrup and Okkels (Hospitalstid., Oct. 6, 1927) describe a case of tumor in the stomach in a woman with vague dyspeptic symptoms and pronounced occult bleeding of long duration, causing a grave anemia. Diagnosis was made with the aid of X-ray examination. **Resection** resulted in recovery which has persisted 14 months, to date of writing. Ten cases of sarcoma-like tumors from the literature are cited by the author.

Carcinoma, as indicated by its earliest symptoms, indigestion, pain, loss of weight and coffee ground vomitus, was recognized by Wiel (Cal. and West. Med., May, 1926), the diagnosis being proven correct at operation. The author emphasized the failure of the X-rays in depicting a characteristic picture and urges not to place too much reliance on this aid to diagnosis.

St. John (Annals of Surg., Aug., 1927) analyzed 147 cases of carcinoma of the stomach treated surgically by various operators. Of 57 cases that came to necropsy, the tumor was situated in the pyloric region in 26. There were 37 adenocarcinomas. The liver and the regional lymph nodes were the most frequent sites for metastases. In 122 cases, pain was a distinct symptom. In 103 of the cases, repeated vomiting was recorded. In 78 cases, an abdominal mass had been recorded before operation. Nine of the patients who, on exploration, were found to present extensive carcinoma of the stomach, were under 35 years of age.

The total number of **complete extirpations** of the stomach reported up to 1927, according to Miyagi (Arch. f. klin. Chir., Jan. 7, 1928), was 90. Of these 34 were followed by recovery. Five cases of complete extirpation for malignant disease are reported by the author. In his experience, a median longitudinal incision combined with a left-sided transverse incision affords the best approach. He found **esophagojejunostomy** preferable to esophagoduodenostomy. Liquid food is given the day after operation. The mortality in his own experience and in that of others is 44 per cent.

#### STROPHANTHUS GRATUS (OUABAIN).—THERAPEUTICS.—

Vaquez and Lutembacher (Presse méd., Feb. 1, 1928) prefer ouabain to digitalis where there is pronounced, persistent dilatation of the heart; in such cases digitalis, while slowing the heart rate and overcoming arrhythmia, fails to dispel edema and oliguria because it is unable to reduce the size of the heart. Some patients with fibroid lungs or spinal curvature, are refractory to digitalis from the start; in these cases, attended with insufficiency of the right side of the heart but no disturbance of rhythm, ouabain may advantageously be substituted for digitalis. Ouabain is not contraindicated in cardiorenal cases. Intravenous injection is the procedure of choice in acute cardiac insufficiency; intra-muscular use, besides being painful, partly annuls the action of the drug because the latter becomes fixed in the muscle into which it is administered. In acute insufficiency with or without anginal pain or acute edema of the lungs, free venesection is first in order and is to be immediately followed by intravenous injection of 0.25 milligram of ouabain; second and third like doses are to be given at 12-hour intervals and a fourth dose after an interval of 24 hours. In refractory cardiac insufficiency the 4 doses may be given on 4 successive mornings. In cardiorenal

cases, Ribierre and Giroux, Clerc and Bas-courret give ascending doses—0.125 milligram on the first day, 0.25 on the 3 or 4 succeeding days, and finally 0.5 milligram after 1 day's rest. Following up the ouabain with digitalis, after an interval of 2 days, is indicated in irreducible insufficiency in which digitalis had lost its effect previous to the use of ouabain. By the mouth, ouabain is less active, but may be given in the amount of 50 drops a day of a 1:1000 solution or 10 to 20 drops of a 1:250 solution. Synchronous use of ouabain and digitalis is illogical. Rest in bed and a milk or salt-free diet should of course be availed of during ouabain treatment.

**SYPHILIS.—DIAGNOSIS.—**  
**TESTS.**—The comparative reliability of tests has been fathomed by various authors. Becker (Amer. Jour. of Syph., Jan., 1927) regards the *Kolmer complement fixation test* as superior to the *Kahn precipitation test*, although the latter is a valuable adjunct to the Stokes procedure. Utilization of the Kahn precipitation reaction in selected cases has proved a valuable aid in diagnosing syphilis and passing judgment on the question of further treatment. The Kahn precipitation test gives more uniform results in repeated examinations, and is more difficult to reverse from positive to negative by treatment. It shows a greater tendency to accentuation by treatment than the Kolmer test. Roderick, Salisbury and Cates (Jour. Lab. and Clin. Med., Jan., 1928) also deem the *Kolmer test* more reliable and sensitive for the diagnosis of syphilis, and as a prognostic indicator in treated cases than the *Kahn test*, although the latter has merit. For the present both tests should be used simultaneously.

Parallel tests were done by Ruediger (Amer. Jour. of Syphilis, Jan.,

1927) on 311 consecutive specimens. Of these 311 specimens, 211 gave negative results by 3 methods, and 100 gave positive results by 1 or more methods. Of the 100 specimens that gave positive results by 1 or more methods, all gave positive results by the *Ruediger-Wassermann test*, 69 gave positive results by the *Kahn test* and 61 gave positive results by the *Meinicke test*. The Kahn test missed 31 per cent. of the positives, and the Meinicke test missed 38 per cent. of the positives. None of these were shown to be free from syphilis.

In 5 tests made by Schmidt and Zickmann (Amer. Jour. of Syphil., Oct., 1927) on the blood of patients with clinically proved syphilis, both before and after treatment, the *Wassermann reaction* was positive, while both the *precipitation tests* were negative. However, in 3 other cases after treatment, the Wassermann reaction was negative, while both the *Kahn* and *Meinicke reactions* were positive. In 1 patient with a tumor of the testis which was diagnosed as a mixed-cell sarcoma by the pathologist, the Wassermann and Meinicke reactions were negative, while 2 different Kahn tests were positive. The Kahn test failed to show positivity in 6 clinically proved cases of syphilis, whereas the Wassermann and Meinicke tests were positive. In 3 cases of treated syphilis, the Wassermann and Kahn tests were negative while the Meinicke reaction was positive.

In a report of 2116 comparative *micro-Kahn* and *Kolmer tests* by Kilduffe and Hersohn (Jour. Lab. and Clin. Med., July, 1927), it is concluded that the micro-Kahn test is a satisfactory additional method for the serologic study of syphilis. It

should be used, however, in conjunction with, and not in place of, the *Wassermann test*.

Marañón, Comas and Jimena (Siglo Medico, Oct. 1, 1927) found a history of syphilis in 11.1 per cent. of 878 patients. The ratio increased to 38.8 per cent. among the poorer classes. The percentage was lower among the women. In  $\frac{2}{3}$  of the 11.1 per cent. syphilis had a direct influence in the causation of the disease present. Among cases of vascular disease, a history of syphilis was found in 39.8 per cent. In 85 cases of clear-cut syphilis, the *Wassermann test* proved negative in more than 50 per cent. In 138 doubtful cases in which the diagnosis depended on the test, this proved positive in 29.7 per cent.

**SYMPTOMS.**—An important phase of syphilis is the localization of its normal effects in a given system, *i.e.*, regional syphilis, which is frequently overlooked in practice.

**CARDIOVASCULAR SYPHILIS.**—In a series of 105 cases studied by Heimann (Brit. Med. Jour., Jan. 22, 1927), some gave a history of acute rheumatism, while valvular involvement was evident in 81 patients. Yet, the entire series of 105 gave a positive *Wassermann reaction*. The leading symptoms were shortness of breath, 55 cases; pain (cardiac), 44; giddiness, 17; palpitation, 16; fainting attacks, 11; cough, 4; hemoptysis, 1; swelling of legs, 1. The superficial arteries were thickened in the majority of cases but the blood-pressure was rarely above 150 mm. of mercury. The heart was often much enlarged in cases without aortic regurgitation, and in which the blood-pressure was low. A syphilitic myocardial degeneration may occur with-

out valvular mischief, and sometimes without thickening of superficial arteries. Cardiac pain was often mild at the beginning and progressed to true angina pectoris. There was often an inconstant albuminuria of no significance. The mortality of the cardiovascular disease was high, once after it had passed beyond the latent stage. The need of early diagnosis in such cases to insure adequate treatment is self-evident.

Morrison (U. S. Vet. Bureau Med. Bull., Jan., 1928), in reporting 5 cases, also urges that a more careful study of the cardiovascular system be made in all syphilitic subjects. His cases were of tertiary syphilis with myocarditis, all of long standing with marked decompensation. One patient had an aneurism of the abdominal aorta which was not definitely diagnosed. Aortitis was present in 2 of the cases.

Carrera (Prensa med., Argentina, Apr. 10, 1926) has dropped mercury in the treatment of cardiovascular syphilis, as it tends to block the kidneys. He graduates the dose of **neoarsphenamine** according to the tolerance, beginning with 0.05 Gm. ( $\frac{3}{4}$  grain), repeating in 3 days. In syphilitic angina pectoris he does not give above 0.3 Gm. (5 grains) twice a week, and with aneurism of the aorta, 0.15 Gm. ( $2\frac{1}{3}$  grains), 3 times a week. He thus reaches a total of 6, 8 or 10 Gm. ( $1\frac{1}{2}$ , 2 or  $2\frac{1}{2}$  drams) in a series, and then suspends it for 20 to 25 days, possibly alternating with **iodide**. In 25 cases of myocarditis, the improvement was notable. The only danger is that the series of treatments on these lines may be interrupted before enough of the drug has been given.

**GASTRO-INTESTINAL SYPHILIS.**

—Buettner (Beitr. z. klin. Chir., cxl, 669, 1927) states that in the general diagnosis of syphilis of the gastro-intestinal tract one must consider carefully the evidence of a past syphilis or other localization of manifest syphilis. Heretofore the clinical evidence of spirochetes in the feces or gastric contents has not been available and, according to the experiences of pathologists, appears to be of slight value. Even the demonstration of spirochetes in necropsy or biopsy specimens as well as the diagnosis on the basis of histological findings is often very difficult. For the clinical diagnosis the author recognizes the importance of the symptomatic triad of an acidity, the absence of occult blood, and a relatively poor general condition, in addition to the signs of syphilis, which include the nocturnal pains. He attaches the greatest diagnostic significance to the X-ray examination of suspected cases. The roentgenologic evidences of syphilis of the stomach are easily explained by the anatomical processes (syphilitic infiltration and gumma with a tendency to connective tissue contraction and also submucous cell infiltration throughout the entire gastric wall), as follows: (1) the rigid, contracted stomach (microgastria) from which there results the rigid macrogastria as a result of stenosis and decompensation, (2) the dual form of the disease foci, for example, pyloric stenosis and filling defect at the fundus, (3) the shallow form of the constrictions, without the production of spasms, and (4) the functional properties of the evacuation mechanism based on the rigidity of the wall of the stomach.

Lévy-Franckel (Ann. des mal. ven., Feb., 1928) observed a case of *syphilitic ulcer* of the stomach in a man, aged 46 years, whose 1st symptom was a severe hematemesis. There was a history of infection 12 years previously and the Wassermann reaction was positive. All symptoms disappeared after a course of **mercury** and **arsenic injections**. A year later the Wassermann reaction was negative, but X-ray examination showed slight dilatation of the aorta, great enlargement of the stomach and signs of deformity in the region of the pylorus. After further antisyphilitic treatment the stomach became of normal size. The author considers that many cases of severe hematemesis may be due to gastric ulcers of a gummatous nature in which an artery is eroded. He draws attention to the suddenness as well as the severity of the bleeding, and states that the lesion is usually situated on the lesser curvature and is associated with characteristic radiologic findings. Another case observed by the author was one of *stenosis of the cardiac end* in a male, aged 65 years. The Wassermann reaction was positive, and the symptoms, which were resistant to mercury and iodide, cleared up completely after the administration of **novarsenobenzol**. Cure was maintained for about a year and then signs of a malignant neoplasm appeared, which probably supervened in the scar of a syphilitic lesion.

**UTERINE SYPHILIS.**—According to Stookey (Amer. Jour. Syphil., Jan., 1927), the absence of the satellite bubo in every case of early secondary syphilitic eruption is strong presumptive evidence that the primary chancre is located on the cervix uteri.



A marked generalized edema induration encountered in the male, without definite ulceration of the mucous membrane, is a common manifestation of primary syphilis. The diagnosis of primary syphilis of the cervix uteri, in the absence of secondary manifestations, is essentially a laboratory procedure. A suggestive case in this connection was reported by Billig (*Lancet*, Mar. 3, 1928) in a woman, aged 35, who complained of left-sided pain radiating down the leg. She had 1 child, 6 years old, and had had 3 miscarriages in January, April and September, 1926. Except for rheumatic fever at 18 and an appendectomy in 1924, she had been fairly healthy, though anemic. There was no history of sore throat, alopecia or skin rashes, except for a single patch of psoriasis on the arm, present for the last 5 years. The husband was healthy and did not give any history of syphilis. On admission general physical examination did not reveal any abnormality other than a palpable spleen. The uterus was enlarged and bulky. Fibroids were diagnosed, and a panhysterectomy was performed with removal of both tubes and ovaries, as at the operation the appearance of the fibroid was strongly suggestive of sarcoma. Microscopic examination of the uterus through the fundus showed the myometrium infiltrated with gummas of varying size, mostly miliary. Miliary gummas were present throughout the endometrium.

**PLACENTAL SYPHILIS.**—An extensive research on the subject of placental syphilis was conducted by McCord (*Amer. Jour. Obstet. and Gynec.*, June, 1926) whose material was 1000 placentas from negroes.

Syphilis was demonstrated in 15.4 per cent. In 966 women, the Wassermann reaction was positive in 22.5 per cent. In 655 babies, the cord Wassermann reaction was positive in 0.7 per cent. The Wassermann reaction repeated on 396 women agreed in 88 per cent. Syphilitic placentas were found in 40.6 per cent. of the positive Wassermann cases, and in 0.3 per cent. of the negative Wassermann cases. In 84 premature babies born alive, the placentas were positive in 28.5 per cent. In 84 premature babies born dead, the placentas were positive in 67.8 per cent. Of 219 positive maternal Wassermann reactions, the cord Wassermann was positive in 14.5 per cent. of the cases. Of 747 negative maternal reactions, the cord Wassermann was positive in 0.107 per cent. Of the positive placentas, 75 per cent. had positive maternal Wassermann reactions.

**BRONCHIAL SYPHILIS.**—Sergent and Benda (*Bull. de l'acad. de méd.*, Paris, Mar. 1, 1927) state that besides the large bronchi and the lungs, the smaller bronchi may be the location of syphilitic lesions. The presence of the latter is revealed by clinical signs and by the X-rays. They describe 8 cases of bronchial or peribronchial sclerosis obviously due to tertiary syphilis. In 8 cases, the process could have developed from tuberculosis, as well as from syphilis. Bronchial syphilis should be differentiated from syphilitic bronchiectasis, which may accompany or rather follow the former. Sclerosis and gummas may be associated. Coexistence of tuberculosis is especially frequent.

**NEUROSYPHILIS.**—In a series of 7828 neurologic patients studied by

Alurralde and Sepich (Revista de la Asoc. méd. Argentina, Nov.-Dec., 1926) in 2 hospitals between the years 1914 and 1926, 1432 had neurosyphilis. The percentage increased from 14.15 in 1915 to 24.20 in 1922 and 21.67 in 1925. Tabes and general paralysis increased from 2.55 and 1.55 per cent. to 5.10 and 2.30 per cent., respectively. In another hospital for the insane the number of general paralysis patients increased from 13.43 to 14.61 per cent., and in the hospital for insane women from 0.93 to 1.3 per cent.

G. Riddoch (Brit. Jour. Ven. Dis., iv, 1, 1928) contends that the prognosis of tabes, diagnosed and treated early, is better than is generally supposed, and that the disease can be arrested in more than half the cases. He stresses the following points: The ankle-jerks are generally affected before the knee-jerks; cutaneous analgesia of the nose commencing on the tip is nearly as common an early sign as diminished sensibility to prick on the inner aspect of the upper limbs; inequality and irregularity of the pupils with sluggish and small reaction to light, especially if asymmetrical, may be as significant as the Argyll-Robertson phenomenon; lighting pains, which are pathognomonic, are often missed through inadequate inquiry into their character.

**Arsphenamine** and its allied compounds, in the treatment of syphilis, other than in the Wassermann negative primary stage, has not succeeded in protecting the human nervous system from syphilis, according to J. L. Birley (Lancet, Mar. 19, 1927). There is no evidence, however, that it has increased the incidence of neurosyphilis. The influence of arsen-

ical compounds in modifying the incidence, time of onset and character of neurosyphilis remains to be determined. Various new methods of treatment are therefore being tried.

The **malaria treatment** so promising in general paralysis, has received considerable attention. P. B. Matz (Jour. Nerv. and Mental Dis., Aug., 1928) states that in the U. S. Veterans' Bureau the method of treatment in vogue in a series of 346 patients was the intravenous injection of about 2.3 c.c. of **malarial blood**, limiting the treatment to those who had no well defined contraindications, such as cardiovascular disease, nephritis or active pulmonary tuberculosis. Of 346 patients treated, 23.99 per cent. were greatly improved; 41.04 per cent. were improved; 22.83 per cent. remained unimproved; 7.51 per cent. became deteriorated, and 3.47 per cent. died. In the same Bureau, Harris (U. S. Vet. Bureau Med. Bull., Feb., 1928) observed 67 patients with neurosyphilis inoculated with **tertian malaria**. Of these 25 per cent. were greatly improved, 40 per cent. improved, 25 per cent. unimproved, 6.7 per cent. deteriorated and 1.3 per cent. died subsequent to treatment. Improvement was observed to follow 2d and 3d inoculations when none occurred from the 1st.

Of 42 patients with general paralysis, 7 with cerebrospinal syphilis, and 1 with tabes dorsalis inoculated with **tertian malaria** by Singleton and Riley (*Ibid.*, Jan., 1927), 42 patients with general paralysis showed improvement, 4 to the extent that they were able to go back to work. Of the 7 cases of cerebrospinal syphilis, 6 became practically serologically nega-

tive. The neurologic condition remained unchanged. In the single case of *tabes* there had been intensive antisyphilitic treatment for 22 months without serologic improvement. Ten months after malaria the patient became practically serologically negative. The cases unimproved were mostly far advanced. Serious complications have not occurred as a result of treatment. The manic and expansive types appeared to respond more favorably than the simple dementing type.

E. Signorelli (Riv. di Clin. Med., Sept. 30, 1927) tried the **relapsing fever** treatment in 3 cases of general paralysis, syphilitic meningitis and *tabes*. The result was excellent in all. Relapsing fever therapy also made previously resistant cases more amenable to treatment with **arsenicals**. On the other hand, treatment with **bismuth** and **arsphenamine** seemed to enhance the therapeutic side of relapsing fever.

**Tryparsamide** is another promising therapeutic agent in neurosyphilis. According to Moore and Sutton (Jour. Nerv. and Ment. Dis., June, 1926), it appeared to be most effective in patients who had previously received prolonged and intensive saturation with **mercury** and the **arsphenamines**. The previously treated patient is also less subject to the Herxheimer-like flare-ups so often seen during the 1st course of tryparsamide injections. Tryparsamide is primarily a resistance builder and a healer of lesions, but not a spirocheticide. This fact precludes its use in early syphilis. Its greatest worth is in *general paralysis* and late *tabes dorsalis*, and in selected cases of central nervous system syphilis which have resisted

systematic and combined intravenous and intraspinal therapy with the **arsphenamines**.

Schelm (U. S. Vet. Bureau Med. Bull., July, 1927) used both **tryparsamide** and **mercury** in combination. It had a beneficial effect physically and mentally in more than 50 per cent. of 100 cases of neurosyphilis treated.

Schwab and Cady (Amer. Jour. Syphil., Jan., 1927) found the use of **tryparsamide** in neurosyphilis superior to standard methods of treatment, as shown by 68 per cent. of the patients with *general paralysis* who were restored or kept at some economic standard of efficiency. Clinically, in about 78 per cent. of the cases, the progress of the disease was arrested or improved. All clinicians who have given this new agent speak favorably of its value in neurosyphilitic disorders.

**GENERAL TREATMENT.**—The various agents reviewed in the above summary of measures now being used or tried in the various regional manifestations of syphilis have also been used with favorable results in general syphilis. But the regional disorders, especially neurosyphilis, have been more resistant than the general systemic manifestations of the disease. Hence the special attention devoted to them in the present connection.

As stated editorially by P. A. O'Leary (Surg., Gynec. and Obstet., Jan., 1928), the various modifications, such as **neoarsphenamine** and **sulpharsphenamine**, and the newer methods of administration have decided advantages in certain cases, but have not proved **arsphenamine** to be a panacea. The original conception that 1 dose cures was discarded

shortly after its advent, and we now know that rarely will 100 doses cure when 20 or 30 have failed. In contrast, it has been suggested that the intensive use of salvarsan in the early course of the disease predisposes to the development of neurosyphilis, but accumulated evidence does not uphold this. As the shortcomings of arsphenamine were recognized, newer remedies were sought to prevent the serious sequelæ of the disease. **Mercury** by inunction or intramuscularly was revived and was used in conjunction with **arsphenamine** because it had been shown that mercury by mouth was wholly inadequate to control the disease. At the present time certain syphilographers resort only to the use of mercury by inunction during the early phase of the disease, believing that the allergic influences, that are stimulated by rubbing, materially aid in control of the infection. The use of the **iodides** has always been advocated in the late form of the disease, without knowledge, however, of what is accomplished, or how.

Various other metals have been used in an effort to find a substitute to fulfill the faith originally placed in salvarsan, and **bismuth** seemed most closely to approach the ideal.

Its use intramuscularly does not supplant the arsphenamines, but it has possibly a higher therapeutic efficiency than mercury. Continued experience with bismuth may reduce the enthusiasm attending its present use.

The intensive application of **arsphenamine, mercury, and iodides** will cure approximately 75 per cent. of patients with acute syphilis who follow the therapeutic regimen outlined for them. The time, energy, and expense entailed in such a course of treatment is greater than the majority of young adults, who are most prone to acquire the disease, will expend in ridding themselves of the infection. Hence the frequency of clinical relapse in acute phases of the syphilitic process.

The period of latency, varying from a few years to 20 years or more, is dependent on the patient's resistance to the infection. In contrast, the patient in whom paresis of syphilitic aortitis develops within 3 years after the infection is acquired lacks a defense reaction mechanism. In other words, the type of soil on which the *Spirocheta pallida* falls determines the crop of complications to be reaped. Unfortunately arsphenamine influences this soil but slightly.

## T

**TABES DORSALIS.—SYMPTOMS.**—Noah Fox (Ills. Med. Jour., July, 1928) calls attention to the fact that what has been termed by Charcot "laryngeal vertigo" is simulated in the early stages of tabes dorsalis even though no gross pathology be discernible in the larynx. He, there-

fore, proposes that where no such lesion occurs in the larynx, and the vertigo coincides with the presence of tabes, that the term "laryngeal crisis of tabes" be applied to the phenomenon.

According to J. A. Hodges (Va. Med. Mthly, Apr., 1926), the "stair



*sign*," which determines the patient's ability to descend properly a series of stair-steps, with the eyes open, but not directed to his feet, or in certain cases with the eyes closed, is one of the most delicate and definite tests of ataxia, often apparent before any other signs. The procedure tests at one time the afferent impressions from both the muscles and joints, deficiency of which is at the bottom of the ataxia of tabes. A short stair-case is selected and the patient made to descend the stairs, abstracting his attention from everything else and looking straight before him. If the ataxia is advanced to any degree he cannot lift up his legs and put them down properly in descending, say, 8 to 12 steps as easily as he could walk on a floor. If it is a case that does not manifest ataxia with the eyes open, the patient is made to close his eyes and descend a smaller number of steps; ataxia will then often be manifested to an unexpected extent. Nine out of 23 cases of early tabes showed ataxia by this test before it was demonstrable by Romberg's sign, the wash-basin sign, the heel and toe sign, etc., or before other positive tabetic reflexes and manifestations became apparent.

On the basis of clinical evidence Dupuy Dutemps (Médecine, Feb., 1925) has reached the conclusion that the Argyll-Robertson pupil is not a conclusive sign of a central lesion, and that it is frequently due to a peripheral lesion, affecting the neuromuscular apparatus of the iris. The lesion is limited to the sympathetic area of the ciliary neuron, either primarily localized in the cells of the ciliary ganglion or of the choroid, or in the ciliary nerves. Haenel (Münch.

med. Woch., May 20, 1927) recalls a sign of tabes which he formulated in 1909: absence of pain from pressure on the eyeball. It was noted in 50 per cent. of patients with tabes. Unilateral increased tenderness of the eyeball in persons complaining of headaches suggests a disease of the accessory nasal sinuses.

**TREATMENT.**—The **malaria treatment** has been tried in tabes as in various other nervous disorders. Hesse (Med. Klinik, June 11, 1926) states that he obtained satisfactory results. The tabetic process seemed to have stopped in the majority of his patients. Lancinating pains sometimes become intolerable during the fever. In 30 unselected cases, Wüllenweber (Münch. med. Woch., Dec. 2, 1927) obtained clinical improvement in 87 per cent.; also in the reactions of the cerebrospinal fluid, in 82 per cent. There were 2 deaths with symptoms of vasomotor collapse. In consideration of the relatively good prognosis as to life for tabetic patients, as compared with general paralytics, **malaria treatment** is justified in the 1st named, only in strong persons, without pronounced aortitis, obesity or hypertonia. The 2 fatal cases were complicated by aortitis. The gastric crises and lancinating pains in the lower extremities, which form the chief indications for malaria therapy, may be temporarily exacerbated by the fever to such an extent that the treatment can be continued only under an **opiate**.

A disturbance of the acid base equilibrium having been observed by Marinesco, Sager and Façon (Presse méd., Feb. 4, 1928) as an explanation of the sudden appearance and disappearance of the crisis, the authors

used in treating the gastric crisis **intraspinal injections** of from 1 to 2 c.c. of a 25 per cent. **magnesium sulphate solution** freshly prepared and perfectly sterilized. In the 8 patients thus treated, pain and vomiting disappeared entirely within from 30 to 50 minutes. Some patients needed another injection after 2 or 3 days; in others the interval was lengthened to several months.

The **surgical treatment** of tabes was resorted to by various observers. Mandl (Deut. Zeit. f. Chir., July, 1927), after resorting to it in 9 cases of gastric crises, bilaterally in 6, regards the operation of material aid. Although complete cure was not obtained in any case, he believes that the patient with frequent attacks, who has not benefited by internal treatment, should be given this chance. The patient is better nourished and the general condition is improved. He operates, when possible, on both sides at 1 sitting and prefers local anesthesia. He **extirpates** the **rami communicantes**, drawing out with them the sympathetic plexuses. Atony of the stomach does not follow the operation.

Another, though kindred procedure for gastric crises, was resorted to by Vergrugge and van Bogaert (Lyon. chir., Jan.-Feb., 1927): **section of the right intercostal nerves** and the corresponding rami communicantes, between the 7th and the 10th dorsal vertebræ. The gastric phenomena and the girdle pains subsided immediately. The same operation previously done on the left side had been without effect. The patient died shortly after from cachexia. In a 2d tabetic patient, however, severing of the right intercostal nerves and the

rami communicantes between the 5th and the 11th dorsal vertebræ brought about disappearance of gastric crises. There has not been a recurrence for 9 months to date. In a case similarly operated on by Stein (Deut. Zeit. f. Chir., Oct., 1926), however, the result was only a shifting in the intensity of the symptoms: the retching and vomiting were lessened and the gastric pains became more severe.

### **TACHYCARDIA, PAROXYSMAL. —SYMPTOMS.**

—In 15 out of 104 cases of this cardiac disorder studied by Barnes (Amer. Jour. Med. Sci., Apr., 1926), the following cerebral manifestations were observed: vertigo, hemianopsia, temporary blindness, fainting, falling, with or without loss of consciousness, and epileptiform seizures. They occurred most frequently in cases in which the origin of the impulse and its propagation in the heart varied the greatest from normal. Their presence, however, does not affect the prognosis in attacks of paroxysmal tachycardia. The prognosis depends on the type and degree of the underlying cardiac injury. In 19 cases studied by Barnes and Willius (Amer. Heart Jour., June, 1927), the cardiac pain was similar in type and location to that seen in cases of angina pectoris, from which it is chiefly distinguished by the absence of the relation of the pain to factors which precipitate attacks of angina pectoris, and also by the fact that the painful seizures tend to occur over a long period of years without a serious outcome. In contrast to the pain of angina pectoris, except that which occurs in coronary occlusion, the pain in paroxysmal tachycardia lasts much longer as a

rule. Treatment of the pain in paroxysmal tachycardia consists in measures which have as their objective the control of the paroxysms of rapid heart action.

**TREATMENT.**—The effects on auricular paroxysmal tachycardia of epinephrine, quinine, quinidine, atropine and digitalis were studied by Otto and Gold (Amer. Heart Jour., Oct., 1926) in a patient subject to spontaneous attacks of this condition. Epinephrine induced attacks in this patient indistinguishable from those occurring spontaneously. Quinine failed to abolish attacks occurring spontaneously or those produced by epinephrine. Under **quinidine** spontaneous attacks did not occur, nor could they be induced by epinephrine. Paralysis of the vagus by **atropine** prevented the induction of a paroxysm by epinephrine. Digitalis in a full dose did not produce an attack, and did not prevent the induction of a paroxysm by epinephrine. The author stresses the fact that a drug may prevent the onset of an attack and be unable to stop a paroxysm.

**TALIPES.**—J. T. Rugh (Amer. Jour. Surg., Apr., 1927), referring to the relation of the plantar fascia in talipes cavus recalls, with additional evidence, the operation he first described in 1919, the principle of which consists in the removal of the structure that is primarily responsible for the deformity, the cause of the relapse and of the continued progress of the deformity. He advocates its replacement by a **fat and fascia flap** taken from the patient's leg.

**TESTICLE.—UNDESCENDED TESTIS.**—In a comprehensive experi-

mental and clinical study by Wangenstein (Arch. of Surg., Mar., 1927), he states that an undescended testis owes its imperfection to its position. Scrotal fixation of the undescended testis in its physiologic position before the histologic changes incident to puberty occur will enable it to develop normally. It should be borne in mind, however, that deficient development is a frequent cause and that in many cases, as urged by Sajous,  $\frac{1}{2}$  grain (0.03 Gm.) of desiccated **thyroid**, 3 times a day, will suffice to cause the organ to develop to its normal size and efficiency.

Out of 60 cases of undescended testicle observed by Rivarola and Cucullu (Bol. y Trab. de la Soc. de Cir. de Buenos Aires, Nov. 23, 1927), it was bilateral in 32 per cent.; on the right side in 50 per cent. and on the left side in 18 per cent. Of the 79 testes involved, 91 per cent. had an external inguinal, 6 per cent. an internal inguinal and 3 per cent. an intra-abdominal location. In 71, the operative result was excellent in 51, good in 19, fair in 1. Hernial sacs were found in 45 per cent. Including 28 previously reported cases, the series embraces 88 cases treated successfully. In 50 cases of inguinal retention of the testis treated by Southam and Cooper (Lancet, Apr. 16, 1927) by **placing the testis in the scrotum**, good anatomic results were obtained in 36 cases; in 14 the treatment failed. Two cases occurred in twins; in both brothers a retained testis, accompanied by a hernial sac, was found on the right side.

Meyer (Surg., Gynec. and Obstet., Jan., 1927) analyzes 64 operations done according to **Torek's technique** for undescended testis, **orchiopexy**,

15 being bilateral cases. In every instance the testes were well placed in the bottom of a well formed scrotal sac. The testes had not atrophied or retracted up against the pubic bone, or come to lie in the upper scrotum in any instance. Gangrene of a testis did not occur. The hernias have remained cured.

#### TETANUS.—ETIOLOGY.—

The automobile is blamed, with justice, for a material increase of accidental deaths. In 1 direction, however, it has decreased mortality by greatly reducing the number of horses used, and the dissemination of tetanus pathogenic organisms in the streets. Infection through the ear (Berman: Lancet, Feb. 11, 1928), by sand-fleas (Rohardt: Münch. med. Woch., June 24, 1927), an oral lesion (Reuter: Ohio State Med. Jour., July, 1927), birth in a wagon with probable contamination by stable dust (Deshayes: Gaz. des hôp., Sept. 28, 1927); abortion (Auvray: Bull. de l'acad. de Méd., Paris, July 13, 1926), and as a result of vaccination (Armstrong: Jour. Amer. Med. Assoc., Mar. 10, 1928) have been recorded by the authors enumerated.

Carriers of tetanus spores are being increasingly incriminated. Out of 487 specimens of human feces from California examined by Bauer and Meyer (Jour. Infect. Dis., Apr., 1926), 24.6 per cent. were found positive for tetanus spores. Of the 120 tetanus bacilli isolated from these specimens, 63.3 per cent. were Type I; 7.5 per cent., Type II; 17.5 per cent., Type III; 2.5 per cent., Type IV, and 5 per cent., Type V. Type VI had not been found. In addition to these, 3 strains of tetanus bacilli were found

which were not agglutinated with any of 6 type serums tested. Type VII serum was not available; therefore it was not determined whether these strains are Type VII or belong to a new serologic group heretofore not described.

**PROPHYLAXIS.**—M. Nicoll, Jr., (N. Y. State Jour. of Med., May 1, 1926) calls attention to the fact that deaths from tetanus in the State of New York from 1907-1925 were only  $\frac{1}{3}$  the number that occurred 18 years ago. This is attributed, however, to no other cause than the more general use of **tetanus antitoxin** as a preventive. The fact that tetanus occasionally occurs after a single preventive dose of antitoxin strongly suggests the advisability of administering twice the standard preventive dose at the 1st inoculation. An analysis of 262 cases of tetanus, in which the method of treatment is known, fails to show greater value of the intraspinal method over the intravenous alone or in combination. There seems to be some indication of the value of massive doses of tetanus antitoxin.

**TREATMENT.**—While, according to Wainwright (Arch. of Surg., May, 1926), *intraspin*al injections of **anti-tetanus serum** are harmful, increase mortality, and should be abolished, its administration by vein in doses of from 30,000 to 50,000 units or more, according to the severity of symptoms and the time since onset, will divide, he believes, the present average mortality rate by 2, or 3, or more. The efficiency of this dose and route will depend directly on the promptness with which it is given. If the initial dose has to be repeated, it should be approximately the same



size and by vein only. In the last days of convalescence, intramuscular injections are allowable. The best sedative is **chlorbutanol**, given in a dose of 30 grains (2 Gm.) dissolved in hot whisky, by mouth, or 75 grains (5 Gm.) in hot olive oil, by rectum, repeated sufficiently often to keep the patient relaxed and drowsy till the danger is passed.

Freedlander (Annals of Surg., Mar., 1927) treated 25 consecutive cases of tetanus with large frequently repeated intravenous injections of **tetanus antitoxin**, with a mortality of 36 per cent. In 11 of these there was an incubation period of 10 days with a mortality rate of 45.5 per cent. If the 6 fatal cases in which death occurred before sufficient antitoxin could be administered are excluded, the mortality rate would be 12 per cent.

Various *untoward effects* had followed the use of tetanus antiserum: ascending paralysis in a man of 53 years, followed by recovery, reported by J. Lerond (Bull. de la soc. méd. des hôp., Dec. 10, 1926); 1 of polyneuritis with partial paralysis which still existed 2½ years, when reported by Crouzon and Delafontaine (*Ibid.*, June 18, 1926); recurrent rheumatism with valvular lesions in a girl of 10 years, the cardiac lesions persisting when reported by L. Morguio (Arch. Lat.-Amer. de Pédiat., May, 1927).

Efforts to enhance the effects of the serum have also been recorded. Dufour, Widiez and Casteran (Bull. de la soc. med. des hôp., June 25, 1926) obtained prompt and satisfactory results from **antitetanic serum with chloroform anesthesia** 10 days after the injury in a man of 30 years. Huber (Beitr. z. klin. Chir., cxi, 503,

1927), in the treatment of 3 groups, used large doses of serum in the first group with a mortality of 76.3 per cent.; in the 2d group, he gave besides the serum, **magnesium sulphate** in large doses, with a mortality of 77.7 per cent.; in the 3d group, serum was given in moderate dose, but **narcotics, i.e., morphine, chloral, phenobarbital and magnesium sulphate** were also used to control muscle spasm, with a mortality of only 40 per cent. The comparatively low mortality here is attributed by the author to prevention of either or all of the direct lethal factors, glottic or diaphragmatic spasm causing asphyxiation, or heart failure, by the narcotics in full doses.

Sahlgren (Hygiea., Sept. 30, 1927) tried, in a case of tetanus in a man, aged 42, large doses of **parathyroid extract-collip**, and also, during part of the time, with calcium chloride, without noteworthy effect on the calcium content of the blood and with no effect on the spasms.

**TETANY. — ETIOLOGY.** — To the many known causes of tetany, the professional or endemic, the gastrointestinal, that due to infectious diseases or poisons, child-bearing including the puerperium and nursing, that due to nervous disorders, diseases of the thyroid, parathyroid deficiency, etc., E. Moro (Klin. Woch., May 21, 1926) adds a form met with during cold weather, in March especially. He attributes the indisposition to the absence of light in the homes during the winter, with consecutive rickets and its metabolism tending to hypocalcemia.

**TREATMENT.**—Aside from the use of parathyroid extract considered

under the next heading, various agents have been given a trial. Sicard, Paraf and Mayer (Bull. de la soc. med. des hôp., July 9, 1926) used **sodium bicarbonate** in 2 per cent. solution intravenously, orally and per rectum, in a child of 3 years, arresting permanently the spasm.

Dennig (Münch. med. Woch., Apr. 22, 1927) obtained good results in tetany in adults with **calcium or ammonium chloride**. The daily doses, however, were as large as 15 Gm. ( $3\frac{3}{4}$  drams).

**Ammonium chloride** administered orally was also found by Wenner (Amer. Jour. Physiol., Aug., 1927) to be efficacious in the prevention of tetany in parathyroidectomized dogs. Dogs in violent tetany recover within  $1\frac{1}{2}$  hours after receiving from 100 to 200 c.c. of a 5 per cent. solution. Thyroparathyroidectomized dogs receiving daily administrations of ammonium chloride for from 30 to 40 days become readjusted to the loss of the parathyroids and could be placed on a meat diet without ill effects. The author suggests that ammonium chloride may render the blood more acid and thereby produce a rise in the serum calcium and a disappearance of the tetany.

**PARATHYROID TETANY.**—The dominant note in this connection is the influence of **calcium lactate** upon the genesis of tetanic spasm.

According to Cameron and Moorhouse (Jour. of Biol. Chem., Apr., 1925), the constancy of the blood calcium depends on the slightly dissociable organic calcium compound present in the plasma, which holds a definite amount of inorganic calcium in the latter through a series of interlocked equilibria. Parathyroid tetany

is due directly to the slight diminution (1 or 2 mgm. per 100 c.c.) in the inorganic calcium of the plasma, resulting indirectly from a diminution of the organic compound. The apparent inability to restore calcium to normal levels by feeding calcium compounds is due, not only to the fact that the organic calcium is no longer estimated in the serum, but also to the fact that its diminished amount can no longer prevent some of the normal inorganic calcium from escaping. This indicates, clinically, that in order to prevent tetany repeated small doses of **calcium salts** should be given at frequent intervals. This accounts for the observation of C. L. Ogle (Jour. Amer. Med. Assoc., May 16, 1925) that the intravenous injection of **calcium lactate** in a solution of from 2 to 5 per cent. invariably relieved the tetanic symptoms almost instantly. He also noted that massive doses of as much as 1100 grains (73 Gm.) given daily likewise controlled the disorder and, moreover, as regards calcium intake, diet, intestinal stasis, and menstruation, that the human and canine tetany were similar. This accounts for the fact that Dragstedt and Sudan (Amer. Jour. Physiol., July, 1926) found that adult dogs may be kept alive and in good condition after a complete thyroparathyroidectomy by the oral administration of **calcium lactate**. Milk, from 500 to 1500 c.c. (1 to 3 pints) daily, did not prevent the appearance of parathyroid tetany in adult dogs, nor did it preserve the life of these animals after thyroparathyroidectomy. It was even less effective in a young dog. Milk given in amounts from 1500 to 2000 c.c. (3 to 4 pints) daily did not control the tetany of preg-

nancy or lactation. The familiar ameliorating effect of a diet of cow's milk in parathyroid tetany is more probably due to its content of **lactose** than to its content of calcium. It is also suggested that the superiority of human milk over cow's milk in preventing infantile tetany is due to its greater amount of lactase and in part due to its decreased amount of phosphate rather than to its calcium content.

In a man of 46 years, in whom the tetany was accompanied by epileptoid and intestinal disturbances, Liu (Jour. Clin. Investig., Feb. 20, 1928) found that **parathyroid extract** alone gave relief, besides causing a rise of the blood calcium. When the latter approached normal, there was an increased retention of calcium, but when it rose above normal a decreased retention occurred. Codliver oil, ultraviolet irradiation, kaolin, calcium chloride and hydrochloric acid all proved ineffective. Evidently a primary parathyroid deficiency was the cause of the tetany.

In 2 cases of infantile tetany treated with small doses of **parathyroid extract** by Shohl, Wakeman, and Shorr (Amer. Jour. Dis. Child., Mar. 1, 1928) the drug had but little effect in the first infant, while in the second, it controlled the symptoms. The benefit was only transitory, however, and ceased when the parathyroid was stopped. The benefit was brought about without gross changes in the calcium and phosphorus metabolism. During the use of parathyroid extract there was a normal excretion of sodium and potassium, while during the relapse following withdrawal of parathyroid, the excretion of sodium increased, and potassium was retained.

### THYMUS. — STATUS LYM- PHATICUS.

—The prevailing confusion concerning the functions of the thymus gland is reflected in what "knowledge" is published concerning this disorder. As Boyd (Editorial in Jour. Amer. Med. Assoc., Aug. 13, 1927) states: "inadequate understanding of the natural changes in the condition of the thymus from time to time in different persons is responsible for much misconception about the so-called status thymicolymphaticus in particular. The growth curve of the thymus in a well nourished child is of the same type as that of the lymphoid tissues in general. Fluctuations in the weight of the thymus at any age period are concomitant with fluctuations in body weight. Some illnesses may, however, affect the thymus before they show an influence on the general state of the body's nutrition. Accidental involution also may occur, as well as the age involution beginning at puberty. The size and structure of the thymus present large factors of uncertainty in any attempt to base diagnostic statements on them. The concepts of "lymphatic constitution" unquestionably need considerable revision, with abandonment of many obscure views. (The reader is referred to the subject of **thymus** in the 1st volume of the 10th edition of the CYCLOPEDIA in the article on ANIMAL EXTRACTS.)

In a study of the blood sugar in status thymicolymphaticus in 3 cases, MacLean and Sullivan (Amer. Jour. Med. Sci., May, 1926) found the values to be low (42, 52 and 57 mgm. per 100 c.c.). In 1 case of suprarenal hemorrhage, a blood sugar of 25 mgm. per 100 c.c. was found. In 6

cases of convulsions produced by conditions other than status thymicolymphaticus, the authors found the blood sugar normal or increased above normal. In 6 cases of enlarged thymus shown by X-rays, they found 5 blood sugars within normal limits and 1 very slightly decreased. In 6 cases in which the blood sugar was determined within  $\frac{1}{2}$  hour before death on patients with diseases other than status thymicolymphaticus, the values were normal or above normal. The authors conclude that acute suprarenal insufficiency is the immediate cause of sudden death in status thymicolymphaticus. Hypoglycemia was not uncommonly found while morbid changes in the thyroid and suprarenals were also found in 100 cases studied by Anderson and Cameron (Glasgow Med. Jour., Sept., 1927).

Dupérie (Tribune méd., Jan., 1928) warns against a diagnosis of hypertrophy of the thymus merely on the basis of X-ray shadows. The weight and size of the organ not only varies in normal subjects, but the hypertrophy may be antero-posterior and not transverse. A similar warning was published by J. L. Morse (Boston Med. and Surg. Jour., Feb. 16, 1928).

**TREATMENT.**—Despite the prevailing confusion concerning the thymus and status lymphaticus, the fact remains that, as stated by R. P. Sturr (Med. Press, Apr. 4, 1928), a thorough analysis of the cases studied has indicated that the enlarged thymus produces both pressure and toxic symptoms, and that any child giving the slightest indication of thymic enlargement, should have an early X-ray examination. He regards X-ray therapy the method of choice

in enlargement of the thymus, and urges that it is harmless under the proper administration and unattended with danger.

J. D. MacRae (So. Med. Jour., Aug., 1927) denies that thymus enlargement is an invariable accompaniment of status lymphaticus which he looks upon as a group of pressure symptoms rather than a constitutional state. While it has been shown that thymus enlargement responds readily to X-ray treatment, he states that this form of therapy must be administered with great caution to children under 3 years old, which is the age at which the physiological process of involution starts. Complete destruction of the thymus in early infancy is considered to be dangerous, because young animals on which thymectomy has been done become fat, flabby, and stupid. Their bones are small and lacking in calcium. He formerly used larger doses than he uses at present. He now administers treatment once a week for a month with the following factors: 5 milliamperes, 8-inch spark gap, 1 millimeter of aluminum filter, 10-inch distance, 1.5 minutes exposure to the anterior chest and the same posteriorly.

**THYROID GLAND.—PHYSIOLOGY.**—In a study of the effects of thyroid feeding on the albino rat, G. H. Wang (Bull. Johns Hopkins Hosp., May, 1927) found that it produces a marked decrease of its running power. The excess of food energy consumed by the animal seems to be entirely in the oxidation process, so that none is left for greater mechanical activity. This fact, however, suggests only a possible explanation as to why the motility is



not increased. Two explanations of this phenomenon are available: The increased metabolism produced by the thyroid feeding may injure the tissues and thus depress the activity, as it is definitely known that any illness affects the activity of the rat more readily than any other phase of its behavior. The 2d explanation, however, seems more likely. The thyroid feeding may render the animal more susceptible to fatigue. A. V. Hill and others have suggested that an animal's ability to perform muscular work is limited by the pumping power of the heart. In the case of the hyperthyroid rats, the greater metabolism requires that the heart circulate the blood more rapidly in order to supply sufficient oxygen for the burning process. Muscular activity further increases these demands, so that a stage is soon reached at which more oxygen is required than the heart can supply, the waste products which are known to produce fatigue accumulate in the body, and the animal is unable to run.

The effect of thyroid therapy on normal children and children showing hypothyroidism was studied by Topper and Cohen (Amer. Jour. Dis. of Child., Feb., 1928). Relatively large doses do not seem to influence the basal metabolism of normal children, but 4 children showed a remarkable increase in growth during this period. As to whether the basal metabolic rate should be the only criterion of the efficacy of thyroid therapy in normal persons, and why its action on the normal adult and in the normal child differ, is that as a metabolic catalyst, thyroid increases the phase of metabolism which is dominant in the individual: anabolic,

or growth processes, in the child, and catabolic, or oxidative processes, in the adult. This is in line with Kendall's opinion that thyroxin speeds metabolism in the direction in which it is going.

Abelin (Schweiz. med. Woch., June 5, 1926) found that the increase of the basal metabolism as well as of the specific dynamic action due to administration of thyroid tissue to rats may be inhibited by fat. The glycogen fixation in the liver of such animals remains almost normal if fat is added to the food. This suggests that fat counteracts the injurious effect of thyroid on the metabolism, especially of carbohydrates.

Truesdall (Amer. Jour. Physiol., Mar., 1926) states that thyroid extract, besides its familiar effects, decrease in body weight, increase in rate of pulse, slight increase in body temperature, increased restlessness and slight diarrhea, causes a decrease in continuous secretion of gastric juice. The gastric secretion following a meal was decreased during thyroid feeding, the rate and extent of the effect depending on the amount of the thyroid fed and the individual resistance.

**PREPARATIONS AND ADMINISTRATION.** — Harington (Biochem. Jour., vol. xx, 1926) and Harington and Barger (*Ibid.*, vol. xxi, 1927) synthesized a substance similar in all particulars to thyroxin obtained from animal thyroids. This **synthetic thyroxin** has been tested by Lyon and Redhead (Edinburgh Med. Jour., Apr., 1927) for physiologic activity on 2 myxedematous subjects. Striking changes followed the administration of the drug. The metabolic rate rose immediately and

rapidly, declining after the drug was discontinued. The rise in the temperature and the pulse changes closely parallel the alterations in the basal metabolic rate. Reduction in weight took place in both subjects. Notable change in the blood-pressure was not observed. Diuresis and diarrhea were caused after each injection in 1 case. The clinical improvement was striking.

In experiments on rats, Abderhalden and Wertheimer (Archiv v. d. ges. Physiol., June 8, 1927) were able to prevent the tendency of a meat diet to enhance the action of thyroxin by adding carbohydrates to the diet. **Ergotamine** also counteracted the action of thyroxin, even when it was administered several days before the latter substance.

The dissimilar activity of various thyroid preparations have often been noted. In truth, parallelism between iodine content and activity of preparations does not exist. Liebesny and Lenk (Wien. med. Woch., lxxvi, 705, 1926) examined 17 samples of thyroid tablets of various extraction and found that to 1 Gm. preparation 0.85 to 1.475 mgm., to 1 Gm. fresh gland 0.036-212 mgm. iodine is apportioned. The weight of the tablets was not identical even for tablets of the same extraction. As the investigations of Seidel and Finger have shown, the iodine content of the thyroid gland, from which tablets are prepared, oscillates within wide limits; thus, the glands contain 8 times as much iodine in September as in February and in March. The iodine dosage is of greatest importance in the treatment of thyroid disease especially, and the iodine content of thyroid preparations should be constant. The

U. S. Pharmacopeia prescribed a definite iodine content of thyroid preparations. The authors, by removing certain ballast substances, have prepared easily disintegrating tablets of 0.2 mgm. iodine in organic combination. These standardized preparations now call forth no disturbances whatever.

Reid Hunt (Can. Med. Assoc. Jour., Nov., 1925) contends that the ideal standardization of thyroid products would appear to be attained only through tests of their comparative potency on basal metabolism. This method has its practical limitations. For that reason, it is satisfactory to know that the latest studies indicate that there is a close parallel between the physiological activity of thyroid preparations and their iodine content. So long as the laboratory worker can measure the potency of a thyroid preparation with considerable accuracy by estimating its iodine content, physicians should use this index as a guide in therapy.

M. B. Gordon (Amer. Jour. Med. Sci., Mar., 1928), in reporting a case of stammering apparently due to thyroid medication, and in which no hypertrophy of the thymus could be discerned, states that in the Endocrine Clinic of Long Island College Hospital the treatment of *childhood hypothyroidism* and *myxedema* consists of starting with a small dose, gradually increasing it every other week at 1st twice, then 3 times daily. During the alternate weeks no medication is given. The 1st dose is  $\frac{1}{10}$  grain (0.0065 Gm.) thyroid extract, the next  $\frac{1}{8}$  grain (0.008 Gm.),  $\frac{1}{4}$  (0.016 Gm.),  $\frac{1}{2}$  (0.032 Gm.) and so on, until 1 grain (0.065 Gm.) of thyroid extract 3 times a day is reached. It is

continued at this dose adhering to the alternation of 1 week.

### **TONGUE.—BLACK TONGUE.**

—Goldberger, Wheeler, Lillie and Rogers (Public Health Reports, Mar. 23, 1928) recall that experimental black tongue is due to a dietary deficiency which is capable of being corrected by something contained in **yeast**. This preventive in yeast is inactivated or destroyed by heat sufficient to char the yeast. It is retained in large measure after heating in the steam autoclave at a pressure of 15 pounds for 7½ hours, and it is absorbed from an acidulated aqueous extract of either dried yeast or yeast 1st autoclaved at a pressure of 15 pounds for 2½ hours by English fullers' earth. It cannot be identified with any of the older well recognized dietary essentials, but is believed to be identical with the thermostable substance of Smith and Hendrick. The black tongue preventive and the pellagra preventive are both present in yeast.

**CANCER.**—W. W. Schmidt (Jour. Amer. Med. Assoc., Oct. 15, 1927) concludes that cancer of the tongue is far from a final solution. While **surgery** has many defects and limited in its scope, **irradiation** has been disappointing, though it has a place in treatment, often making matters worse. The **electrothermic method** is a decided improvement and has opened the way for relief of many formerly inoperable cases. Its advantages are most marked in early cases.

In 143 cases treated with **radium** by N. Capizzano (Rev. Med. Lat.-Amer., Dec., 1927), there were 19.94 per cent. of 3-year cures. Many of

the patients were 1st seen with the whole tongue as well as the cervical glands already involved. Referring to radium treatment of tongue carcinoma, Evans and Cade (Brit. Jour. Surg., July, 1927) state that in every case the clinical diagnosis was confirmed by histologic examination. In 16 of the cases the primary growth in the tongue completely disappeared after treatment. A combination of **surgical excision and radium** therapy appears to them to be the most satisfactory method.

**TONSILS.**—The importance of these organs in focal infections is such that they may be said to act as causal factors in the genesis of infections in practically all organs. This was emphasized by so competent a clinician as Judson Daland (Annals Otol., Rhin., and Laryn., Dec., 1926) when he published the results of his 25 years' review of his own observations. Briefly, the pathogenic rôle of tonsillar infections encountered were as follows: *Nervous system*: Meningitis, encephalitis, bulbar palsy, chorea, neurasthenia, psychoses, diseases of the spinal cord, cranial and peripheral nerves. *Bones, joints and muscles*: Arthritis, osteitis, periostitis, synovitis, tendovaginitis, myositis. *Alimentary system*: Gastric, duodenal and intestinal ulcer, gastritis, enteritis, cholecystitis, gall-stones, cholangitis, hepatitis, pancreatitis, and appendicitis. *Circulatory system*: Peri-, myo-, and endocarditis, hypertension, aortitis, thrombosis, embolism, anemia, and pernicious anemia. *Genitourinary system*: Nephritis, pyelonephritis, calculus, prostatitis, seminal vesiculitis, endocervicitis, and sterility. *Respiratory system*: Bronchitis, bron-

chiectasis, pneumonia, bronchopneumonia, lung abscess, pleuritis, and asthma. *Skin*: Acne, furunculosis, carbunculosis, alopecia, herpes, herpes zoster, urticaria, pruritus, dermatitis, and ichthyosis. To these may be added diseases of organs which do not belong to the author's working field, those of the eye, ear, nose and throat.

It has long been urged that the protective rôle of the tonsils should under normal conditions assert itself. That such a protective function exists was emphasized by V. Schmidt (Ugeskrift f. Laeger, July 1, 1926), who, on massaging the tonsils in 18 healthy persons found that it caused a reduction of the leukocyte count. The lymphocytes disappeared in the peripheral blood, and he thinks there can be no question that this is a reaction to the forcing out into the blood stream of an antibody formed in the tonsils. Massage of actively diseased tonsils elicited a reaction in the form of a polymorphonuclear leucocytosis. This confirms data from other directions.

Wilkinson and Ogilvie (Lancet, Mar. 31, 1928) studied the relation of tonsils to rheumatism and heart disease in 71 rheumatic children. They found that chronic infection of the tonsils is commonly associated with rheumatism and chorea in children, and frequently causes enlargement of the lymphatic glands of the angle of the jaw. Children who have rheumatism are less likely to develop organic cardiac disease if the tonsils are completely removed. In such children tonsillectomy results in the disappearance of the enlarged glands in more than 70 per cent. of cases. While the enlargement of the glands

may be taken as an absolute indication for the removal of the tonsils in rheumatic children, it is probable that, in order to obtain the best possible cardiac results, tonsillectomy ought to be performed before the glands become enlarged.

Suarez (Rev. Med. Lat.-Amer., June, 1926) wisely recommends testing the coagulation time of the blood as a routine procedure before tonsillectomy. If the blood clots slowly, the operation should be deferred until after **calcium chloride** (3 to 5 Gm. — $\frac{3}{4}$  to  $1\frac{1}{4}$  drams—daily) has restored conditions to approximately normal. If the coagulation time is as long as 30 minutes, it is wiser to refrain from the operation.

Cathcart (Pract., Dec., 1927) holds that too often physicians fail to remove tonsils from adults. He has enucleated the tonsils of 72 persons over 50, of which 24 were over 60. The operation was entirely satisfactory in every case; not only were there no fatalities, but there was never a moment of anxiety during any of the operations; in no case was artificial respiration performed, nor did any of the patients have post-operative hemorrhage severe enough to require ligation of a vessel. It should not be forgotten, however, that occasionally a case of hemophilia may be encountered and that testing the coagulation time—a simple procedure—as recommended by Suarez, will avoid dangerous hemorrhages. In this connection Yearsley (Lancet, Jan. 3, 1925) records 2 cases of severe hemorrhage following tonsillectomy with submucous resection in which a characteristic feature was a strong streptococcus odor. This suggested the injection of 20 c.c. of **antistrepto-**



coccic serum which proved efficient in both cases.

### TRANSFUSION OF BLOOD.

—The condition of the blood of donors has received renewed attention. Powell (Iowa State Med. Soc. Jour., Apr., 1926), in the course of an investigation of 25 donors who had made more than 25 donations each, found weakness and secondary anemia in but 4 cases, although 5 of the donors had given more than 50, and one 63, transfusions. One of the 25 donors who returned recently was found to have active pulmonary tuberculosis. Another was weak; 2 had moderate secondary anemia, and the remainder had normal blood and their general health was excellent. This shows that the same donors may be used repeatedly without ill effects to themselves. Because of its simplicity, safety and satisfactory results, however, the indirect method with **sodium citrate** is preferred by the author.

In a patient with grave anemia due to gastric ulcer Metzler (Deut. Zeit. f. Chir., Mar., 1926) gave a transfusion with 500 c.c. of blood. Both the patient and the donor belonged to group O (I. Jansky). In spite of this, the patient became unconscious during the transfusion. Another transfusion, made 12 days later, killed the patient.

In 1 year Schaly (Nederl. Tijdsch. v. Geneesk., Mar. 6, 1926) encountered 3 cases of impairment of vision soon after blood transfusion, which had been done on account of pernicious or aplastic anemia. In 1 case the eyes had been examined just before the transfusion, and there was no trace of hemorrhage. In 1 case the

eyes were examined post mortem, confirming the extent and the irreparable nature of the disturbances. Vision is not impaired until the extravasated blood spreads toward the macula.

**TRYPANOSOMIASIS.**—In a study of the viability of the trypanosomes Schern (Deut. med. Woch., Jan. 14, 1927) found that they ceased to move after a time when placed in blood, but that they revived by the addition of fresh serum or of a liver extract. Later investigation showed that the active substance was sugar, which was absent from the liver in animals that had died of trypanosomiasis. Hypoglycemia appears to be a regular occurrence in trypanosomiasis, which may explain some of the symptoms, convulsions, delirium, hepatic coma, observed. Dubois and Bouckaert (C. r. de la Soc. de biol., Feb. 18, 1927) also found a notable hypoglycemia in rabbits and mice in experimental trypanosomiasis.

G. Le Dentu (Ann. de l'Inst. Pasteur, Sept., 1927) found that treatment of the 2d stage of trypanosomiasis with **tryparsamide** gives a very high percentage of apparent cures; 62.5 per cent. in patients who had been without medication during a period varying from 9 to 24 months. These results were obtained with relatively small doses, totaling about 25 Gm. (6¼ drams) for an adult weighing 50 Kg. (110 pounds). Previous atoxyl treatment did not interfere with the action of tryparsamide nor create a very marked arsenic resistance. An inefficacious tryparsamide treatment, however, provokes a very clear arsenic resistance.

According to Kind (Amer. Jour.

Med. Sci., July, 1926), **tryparsamide** is well tolerated in 20 per cent. solution given intramuscularly, but in 30 per cent. solution causes more discomfort and leads sometimes to abscess formation. It has a definite trypanocidal action in the blood, the lymph and cerebrospinal fluid. It is equally efficacious in all stages of the disease, except in certain cases in which its efficiency is limited.

**TUBERCULOSIS, PULMONARY.—SYMPTOMS.**—In 52 patients in various stages the temperature was taken rectally, owing to its greater accuracy, by Funk and Gordon (Amer. Rev. of Tuber., Dec., 1927), who found that the generalization that the temperature in tuberculosis patients is lower in the morning and higher in the afternoon and evening may lead to many errors in individual patients, especially if the routine includes as few as 2 observations a day, as is practiced in many institutions. They found that it is not uncommon for the 7 and 8 P.M. temperatures to be elevated when the 4 P.M. temperature is normal, or for the morning and evening temperatures to be normal, while the temperature is elevated during the mid-day hours. Thrice daily observations should be made, until the patient is accustomed to the institutional care. Then a continuous 24 hour record is kept, to determine the periods of maximum and minimum temperatures. If these do not occur when the routine observations of the mouth temperature are made, then a special routine is outlined for the patient, as to both the hours and the number of daily observations. At intervals of 10 days or 2 weeks, another 24 hour

observation is made to check the observations of the mouth temperature.

The *basal metabolism* of 5 tuberculous individuals was found by Brock and Haskins (Amer. Rev. of Tuber., July, 1927) to vary between approximately minus 19 per cent. and minus 3 per cent. A comparison between the average basal metabolism of 2 tuberculous subjects studied both in winter and in summer showed a decrease of 9 per cent. and 13.2 per cent. in summer as compared to winter. G. Giegler's (Klin. Woch., Dec. 3, 1927) clinical observations showed that while there is a relation between the basal metabolism values and the early stages of pulmonary tuberculosis, in other stages there was a marked discrepancy. Röth (Beitr. z. Klinik der Tuber., Apr. 20, 1926) observed an increased oxygen consumption in grave cases.

Stivelman (Amer. Jour. Med. Sci., Jan., 1927) studied the *blood-pressure* in 701 tuberculous patients considered free from cardiorenal or metabolic disturbances. While of little diagnostic value early, it declines with the advancement of the tuberculous process. Active cases almost invariably showed a lower arterial tension than comparable quiescent patients. Patients with fibroid disease showed higher pressure values than those with other forms of tuberculosis. The incidence of hemoptysis was greater in those with an average low arterial tension than in those at or above the average. The arterial tension and hemoptysis do not seem to be etiologically related. The few patients under observation in whom pulmonary tuberculosis and syphilis co-existed had a higher blood-pressure and a more favorable immediate

prognosis than patients free from syphilitic infection. The development of an effusion and the induction of pneumothorax did not have an appreciable and permanent effect on the blood-pressure. A rise or a decline of the blood-pressure in patients under treatment did not offer a reliable indication as to the course of the disease. Patients with a higher arterial tension than the average for the age, sex and extent of involvement, however, did better than those whose blood-pressure was below the average.

In a comparative study of the *physique* of 230 patients with pulmonary tuberculosis Neuer and Feldweg (Berl. klin. Woch., May 21, 1926) found that among these 55 were of the sthenic type and 64 of the asthenic, that although the physical symptoms had been about the same in the beginning, the sthenic had a mortality of 4 per cent., while in the asthenic it was 50 per cent.

**DIAGNOSIS.**—Errors in this connection have been recorded by various observers. Maendl and Waltuch (Wiener klin. Woch., Dec. 22, 1927) enumerate fourteen wrong diagnoses. Syphilis, carcinoma, metastases and heart lesions were mistaken for tuberculosis. One patient had been treated for 7 years for fungus of both knee joints. For years he had been confined to bed. The disease was gonorrheal gonitis and under treatment with **milk injections**, etc., he has become entirely able to work. In another case skin tuberculids over the lumbar spine were diagnosed as spondylitis. They warn especially against mistaking burrowing abscesses proceeding from spinal caries for appendicitis or adnexal tumor. Wide opening of the abscess in these

cases leads to mixed infection from without, usually with fatal results.

P. S. Winner (Ills. Med. Jour., Apr., 1927) describes various pulmonary conditions closely resembling pulmonary tuberculosis, and at times admitted to the sanatoria as such. Of 22 cases of lung abscess, the causative factor was tonsillectomy in 32 per cent.; pulmonary infection in 23 per cent.; appendectomy in 9 per cent., and measles in 4 per cent. There were 3 cases of carcinoma of the lung. Among 9942 discharged cases were found 293 cases of pulmonary tuberculosis with positive Wassermann reactions; 2 with syphilis of the lung.

Duany, Alderegui and Alvarado (Rev. de Med. y Cir. de la Habana, Nov. 25, 1927) reported 2 cases of pulmonary mycosis which had been mistaken for cancer and tuberculosis, respectively. In 1 case a diagnostic pneumothorax was attempted. Then multiple abscesses occurred in the upper thorax and neck and the sections revealed typical actinomyces.

F. I. Meyerovich (Klin. Medit., June 27, 1927) describes many possible diagnostic errors in cases of pulmonary tuberculosis complicated by nerve lesions. Enlargement of bronchial and mediastinal glands, thickening of the mediastinal pleura and adhesions of the pleura can cause pressure on the nerves. Irritation of sensory nerve endings at a distance from their source, the viscerosensory reflex of Mackenzie, can give rise to symptoms which are difficult to interpret. Among errors resulting from the involvement of the vagus, the phrenic and the sympathetic, are various abdominal conditions, acute peritonitis, gastric or duodenal ulcer,

appendicitis, renal colic, gall-stone colic and heart disease. Tender points along the course of the phrenic nerve are very suggestive of its involvement. Only by careful examination and by remembering the possibility of the involvement of the nerves can serious errors be avoided.

W. E. Carroll (Amer. Rev. of Tuber., June, 1926) considers that considerable danger lies in "railroad-ing" a patient into a disease that he does not have. Difficulty arises chiefly in 2 groups of patients: *i.e.*, those who present very few abnormal signs and those who present a great many abnormal signs. In the former group the diagnosis of tuberculosis should not be made unless it is obvious that the patient is suffering from some impairment of health, and then only after other causes have been carefully excluded. In a sturdy, thriving child the diagnosis of clinical tuberculosis is not warranted, even if physical and X-ray examinations justify the diagnosis in a child in poor health. Definite clinical entities, other than chronic non-tuberculous pulmonary disease, are at times confused with tuberculosis. At least, such has been true in 10 per cent. of the patients discharged from the sanatorium in which the author is located. Forty-five and six-tenths per cent. of patients discharged from this sanatorium were non-tuberculous. In 20.7 per cent. of cases, there was good cause of one kind or another for recommending the patient for admission. In 24.9 per cent., the patient was admitted under gross error in diagnosis.

Among 153 cases of *early tuberculosis* seen by Chien (Natl. Med. Jour. of China, Apr., 1927), there occurred

13 instances of mitral disease. Cases are presented to show the similarity of symptoms of early mitral disease and incipient pulmonary tuberculosis.

F. Egger (Schweiz. med. Woch., June 26, 1926) confirms the general lag in the movements of the diseased side of the chest, but he has also found frequently an increased action of auxiliary respiratory muscles of the same side. This symptom is most evident when looking at the back of the standing patient. The shoulder of the diseased side rises higher. The angle of the scapula frequently moves about 2 cm. upward while the movement on the other side is very small. The angle moves a little sidewise (outward) at the same time. The arm of the diseased side participates in this. Consequently the hand may move to a distance of about 10 cm. from the body during inspiration.

Trentini (Policlinico, Mar. 7, 1927) observed that slight elevation of temperature, preceding menstruation by 2 days and disappearing with it, indicates, as a rule, latent tuberculosis. If the fever lasts for a few days after menstruation, it may be a sign of an active tuberculous focus.

R. Gaeta (Gaz. degli Osped. e delle Clin., Dec. 11, 1927) states that in patients with latent pulmonary tuberculosis, complaining of "weakness," "loss of weight" and "anemia," the sweat, especially in the axillæ, has a marked formic acid odor. The rôle of the skin in immunologic processes and its relation to internal secretions may explain this change in the secretion of the sweat glands. Meyer notices an increase of oxalic acid in the urine of tuberculous subjects. As formic acid may be formed by the action of oxalic acid on glycerin, it



might be derived from the fat capsule of the tubercle bacillus.

As to *X-ray diagnosis*, Müller (Amer. Rev. of Tuber., Feb., 1927) contends that recognition of a primary focus is never possible by percussion and auscultation. But as every tuberculous disease produces an infiltration and a swelling of the local lymph node, a tuberculous focus should not escape detection in a roentgenogram. On the other hand, percussion and auscultation are indispensable in explaining the roentgenogram.

Monroe and Emery, Jr. (Boston Med. and Surg. Jour., Apr. 8, 1926) urge that films should be taken whenever the symptoms suggest the presence of tuberculosis, and assert that the physical findings are less reliable guides. MacRae (Radiology, May, 1926) states that a study of the infant chest with X-ray will demonstrate all but the most minute tuberculous lesions in their lungs.

Bissell (Amer. Jour. Roentgen. and Radium Therap., Dec., 1926) holds that an experienced examiner will rarely be in error if he adheres strictly to definite and specific rules of interpretation. Roentgenograms taken at intervals, according to Lynham (Brit. Jour. Tuber., Apr., 1926), provide valuable help in estimating the changes in the lungs.

*Examination of the sputum* in 1425 positive cases of pulmonary tuberculosis by Eley and Stafford (Va. Med. Mthly., June, 1926) revealed tubercle bacilli in only 44 per cent. He stresses the fact that repeated examinations of the sputum should be made in any case in which there is cough and expectoration persistent for more than 4 weeks. The far ad-

vanced cases gave the most frequent positive results.

F. M. Pottenger (Can. Med. Assoc. Jour., Dec., 1927), whose vast experience is well known, states that practitioners who are not accustomed to searching stethoscopically for the fine changes produced in the lung by an early lesion had better put more reliance in other methods, such as the clinical history, sputum examination and X-ray; yet in doing this they must understand that these methods are also attended by a considerable degree of error. The custom of taking a single expectoration and examining it by ordinary methods often fails to reveal bacilli though present. In early suspicious cases all sputum raised, no matter where the patient thinks it comes from, should be saved and treated by one of the concentration methods. If samples are collected for 24, 48 and 72 hours and then examined by one of the refined techniques, which should be available in laboratories in all large cities, the presence or absence of bacilli can be determined with a high degree of accuracy. But, as may be recalled, the absence of bacilli does not mean the absence of tuberculosis.

*Blood Sedimentation Test.*—Cutler (Amer. Jour. Med. Sci., June, 1926) considers the sedimentation test more reliable than either the temperature curve, pulse rate or gain in weight, the major guides in the treatment of tuberculosis. By repeating the test at regular intervals, the true course of the disease can be represented graphically for, as the patient improves, the graph should approach more and more the horizontal line, but should he become worse, more and more the vertical curve.

Frimodt-Möller and Benjamin (Tubercle, Nov., 1927) used the sedimentation test in 500 persons in South India, 282 being tuberculous. The tropical climate seemed to influence the test by producing a higher rate of sedimentation than it does in the West. The normal figure for men in South India, at a temperature of 30° C. (86° F.), was 10, with a limit of 15; for women 15, with a limit of 20, expressed in percentage, which is equivalent to a reading of 17.0 per cent. and 25.5 mm. for men, and to 25.5 per cent. and 34.0 mm. for women. The test has its greatest scope in patients treated with **artificial pneumothorax**, when used in tuberculosis, and as a suggestive indication, such as fever, and to afford an idea of the activity of the tuberculous process, in its relations to the clinical symptoms. It has no specific value, however, in the diagnosis of tuberculosis.

**TREATMENT.**—A gold salt solution termed by Mollgaard (Acta Tuber. Scand., III, 337, 1928) "**sanocrysin**," was introduced by him for the treatment of tuberculosis. He found experimentally, that a healthy organism does not react with shock and rise of temperature to sanocrysin injections. An organism sensitized to tuberculosis reacts in the same way as a healthy one, provided that sanocrysin is not injected directly into the tuberculous focus. The degree of the reaction in a tuberculous animal depends on the strain of the bacillus as well as on the state of the infected tissue. Direct injection of sanocrysin into a tuberculous focus produces a reaction in cases in which an intravenous injection will fail. The action of sanocrysin is not that of a simple drug

but of a chemical affinity for certain elements in the tuberculous process. It has been tried by various observers and commissions, but on the whole it is not recommended. It appeared to have some beneficial influence in the ulcerative acute forms but an insignificant action in chronic pulmonary tuberculosis and not be free from untoward effects.

In the field of endocrinology, some attempts at therapeutics have also been made. Dunham (Amer. Jour. Med. Sci., Sept., 1925) tried **desiccated spleen** and **bone-marrow** to increase the number of erythrocytes and hemoglobin production. Out of 23 active cases, 21 showed definite improvement in the blood picture. Moureau and Gruvel (C. r. de la soc. de biol., July 23, 1926), however, found in guinea-pigs inoculated with tuberculous sputum, then treated with spleen extract, that the tuberculous process was not retarded nor was life prolonged. On necropsy, the tuberculous lesions in the treated animals were as pronounced as in the non-treated. Schröder (Deut. med. Woch., June 10, 1927), however, cultivated tubercle bacilli in mediums containing extracts from the spleen and the thymus, and found that such cultures became avirulent and most of the bacilli lost their acid-fastness. On injecting this culture, duly prepared for the purpose, it was found to protect rabbits to some extent against bovine tuberculosis.

Treatment of **X-rays** has been tried by K. von Holton (Zieitsch. f. Tuber., Jan., 1927) in 353 sanatorium patients. Of these, 29 per cent. were in the 1st stage, 58 per cent. in the 2d, and 13 per cent., in the 3d stage. Out of the total, 70 per cent. became

able to continue their work. The author attributes this, at least partially, to the effect of the X-rays. At first he radiates only 1 field and uses small doses, increasing the latter from 6 to 9 per cent., and finally to 12 per cent. of the erythema dose. The average duration of the treatment was 96 days for female patients and 88 days for male patients.

A trial of **calcium chloride** in the treatment of 30 tuberculous patients was recorded by Bothezat (*Revue méd. de la Suisse romande*, June 10, 1926). He used small doses of a 5 or 10 per cent. solution. A dose of 5 c.c. was injected intravenously daily. A series consisted in 12 injections; repeated 3 or 4 times; in 2 cases 7 times, 1 week apart. No by-effects were observed. In 10 advanced patients the treatment did not arrest the process and 8 died. In 13 the condition remained stationary, losing its progressive character, while 7 showed constant local and general improvement. As calcium chloride is eliminated soon after its absorption, it is not retained in the tuberculous foci. The usual doses do not exert any bactericidal action.

In 5 cases of active pulmonary tuberculosis with serofibrinous effusions, D. Priano (*Arch. de los Hosp.*, Buenos Aires, Dec., 1926) tried intravenous injections of crystallized **calcium chloride** in doses of 1.5 Gm. (23 grains). He gave 15 injections, 1 semiweekly, with excellent results in 4 cases, and but fair in the 5th. After extensive and systematic biologic experiments, however, Lunde (*Tubercle*, Jan., 1927) warns that the administration of excessive doses entails 3 risks: (1) metal poisoning; (2) stimulation of the growth of bacilli,

and (3) suppression of the production of antibodies and similar salutary processes. If a number of tuberculous guinea-pigs are treated with an active metal, it will be found that large doses soon cause death from tuberculosis, and that the metallic salt in the strength used in these cases, calculated per unit of weight, increase the production of bacilli.

According to Bosanquet (*Lancet*, Jan. 14, 1928), **tuberculin** may sometimes be of use in: (1) patients who exhibit a persistent mild pyrexia in spite of continued rest in bed; (2) those who have no fever while resting, but suffer repeatedly from a slight return of pyrexia on rising and moving about, and (3) early cases showing slight laryngeal involvement. Prophylactic injections of tuberculin might also perhaps be given advantageously to delicate subjects with bad family histories. The initial dose which he employs, using **Koch's tuberculin**, is  $\frac{1}{100\,000}$  mgm. of solid bacterial content, followed by  $\frac{1}{75\,000}$ ,  $\frac{1}{50\,000}$  mgm., and so on in a febrile case, raising the dose more quickly in the absence of fever and in early cases.

**HEMOPTYSIS.**—In the treatment of this complication A. Jacquelin (*Médecine*, June, 1926) holds that **absolute rest**, appropriate **diet** and the familiar drugs are able to arrest hemoptysis in most tuberculous patients. He found extract of the **posterior pituitary lobe** valuable in the more rebellious cases. The extract should be injected subcutaneously or intravenously and repeated for a few days after the hemorrhage has stopped. The intravenous method, as suggested by Rist, is harmless if the extract is sufficiently diluted and is injected

slowly. The forms of hemoptysis requiring artificial pneumothorax are extremely rare. Nine of the 12 patients on whom he performed the operation presented the fibrocaseous form of tuberculosis. At the 1st insufflation he gives an injection of **pituitary extract**, to which he sometimes adds **morphine** in order to avoid hemorrhage due to the pulling of pleural adhesions on the lesion during the intervention. He generally uses up to 500 or 600 c.c. of sterilized air for an insufflation. Where ulceration of a vessel is suspected, he gives a massive initial insufflation under a positive terminal pressure of 5, 8 or even 10 c.c. of water. In all but 1 of his patients the artificial pneumothorax was followed by rapid arrest of the pulmonary bleeding, which had continued for days or weeks. This was associated with subsidence of fever and improvement in the general condition. In 5 cases the measure had to be discontinued on account of bilateral lesions or insufficient collapse of the lung.

**PHYSICAL TREATMENTS.**— In a series of 40 cases Krusen (Amer. Rev. of Tuber., Aug., 1927) used **heliotherapy** for 6 months, employing another group of 20 cases as controls, both groups being placed otherwise under similar conditions. The author concluded that heliotherapy, properly administered, and preferably by the Rollier method, is of value in pulmonary tuberculosis. The majority of patients like it, are in a much more cheerful mental state, expectoration is apparently easier though slightly increased at first, this being followed by a diminution in the expectoration. Cough is slightly increased at the be-

ginning, then seems to be permanently diminished. Hemoptysis is not a contraindication to heliotherapy. Patients whose skin pigment darkens well seem to be most benefited. It is not indicated, however, in very far advanced or toxic cases.

The **ultraviolet rays** treatment has received support from various directions. On the basis of clinical evidence F. A. Forney (Colo. Med., Feb., 1927) states that **ultraviolet rays** are of value in selected cases, especially to prepare such patients for later **heliotherapy**. Apparent arrest of the disease was recorded in only 6 of the 65 cases forming the basis of this report, however, 35 cases were quiescent; 11 patients were improved and the remainder had received no benefit.

Gerstenberger and Burnhans (Amer. Jour. Dis. of Child., Jan., 1927) found that the **quartz mercury arc lamp** is of considerable value in pulmonary tuberculosis of children. Such infants with extensive pulmonary infiltration, even with cavity formation, might recover. The patients were exposed at least 3 times a week without harm in any case. It becomes a question, however, whether the good results obtained in infiltration cases are not due mainly to the fact that the infiltrations form part of a beneficial immunologic process against the tubercle bacillus, rather than a direct action of the tubercle bacillus.

Tegtmeier (Beitr. z. Klinik der Tuber., May 21, 1927) recommends **respiratory air baths and regulated gymnastics**. The latter increase respiratory effort and convey more oxygen into the lungs, thus stimulating tissue metabolism, increasing the functional activity of the heart and other organs, and, finally, raising the



resistance to tuberculosis. The author stresses the importance of prescribing the gymnastics and insists that a qualified physical director be entrusted with carrying them out. He urges not to scheme or speculate but to prescribe only what is known to have the desired effect. The productive form of the disease lends itself best to this treatment. The exudative type not at all. Patients with a tendency to hemorrhage, and those exhibiting elevation of temperature, fatigue or pain after exercise must be excluded. McClung (U. S. Vet. Bureau Med. Bull., Feb., 1928) considers **exercise** as an indispensable part of the treatment of pulmonary tuberculosis. Selection of exercise to suit each individual case, proper observation as to progress, and graduation of the dose are the keynotes to success.

A review of **pulmonary surgery** in tuberculosis based on their own extensive experience was contributed by Brown and Eloesser (Cal. and West. Med., Mar., 1927). Extraction of the phrenic nerves, multiple rib resection, pneumothorax and the combination of 2 or all 3 of these procedures are the means that may be employed for artificially collapsing the lung and setting it at rest. The results of operations were, roughly, that  $\frac{1}{3}$  of the patients were cured;  $\frac{1}{3}$  were improved, and  $\frac{1}{3}$  died sooner or later. The mortality of the operation was low; for phrenectomy practically *nil*; for thoracoplasty not more than 10 per cent. Eloesser has done 77 operations on 62 tuberculous patients. In 32 thoracoplasty was performed; 1 died of the immediate effects 24 hours after operation; 1 died 10 days later of an acute caseous

pneumonia; 3 others died of their disease; 1, 6 months; 1, 2 years, and 1, 4 years after operation. Probably 10 were cured. The phrenic nerve was avulsed 25 times; there was no operative mortality; 5 of these patients died later in the course of their disease; 7 of the remaining ones had thoracoplasties; only 1 of the 25 was cured or strikingly benefited by the phrenic operation alone. There were 5 patients with intrapleural pneumolyses, of which 3 were cured.

A. J. Cohen (Therap. Gaz., Feb.-Mar., 1927) recalls that Alexander estimates that there are over 30,000 cases in the United States today that are suitable for **pulmonary surgery**, and contends that the use of surgery in the treatment of pulmonary tuberculosis has not received in this country the support that it deserves. There are already 1500 cases reported with 60 per cent. recoveries among a class of patients who otherwise would have been doomed to certain death.

Only a small proportion of cases are suitable for thoracoplasty. The greatest care must be exercised in the proper selection of the cases—the clinician, surgeon and roentgenologist work unitedly to select and carry out the after treatment.

In the course of 13 years, 1009 patients were treated by **artificial pneumothorax** by Rist (Amer. Rev. of Tuber., Mar., 1927). Among these were 759 cases of chronic, common unilateral tuberculosis. Of these 387 were clinically well; 336 are still under treatment. Some of them are without doubt definitely cured, but they feel secure with their collapse and object to its being interrupted. The rest enjoy nearly normal health. The unsuccessful cases number 372,

can be divided into 3 groups; namely: condition unchanged, 33 cases; development of contralateral lesions, 99 cases; deceased 240 cases. Contralateral lesions were the cause of death in 179 cases; perforation of the lung in 18, and intestinal tuberculosis in 10. Empyema, generalized miliary tuberculosis, tuberculous meningitis, hemoptysis, amyloid, distention and failure of the heart, pulmonary embolism after phlebitis and suprarenal tuberculosis were fatal in 18 cases. Rist was unable to produce artificial pneumothorax in 250 cases, owing to extensive pleural adhesions.

**TYPHOID FEVER.**—Lesieur's retrohepatic sign, a slight dulness at the base of the right lung, was also observed by Trentini (Policlinico, Apr. 12, 1926), who attributes it to a pleuritic localization of the infection, if it appears early. When it occurs later, it constitutes the true sign of upward displacement of the enlarged liver.

In a small boy with extreme acute prostration and repeated positive agglutination tests for typhoid, Rodella (Archivos Lat.-Amer. de Pediat., May, 1926) observed no fever or other symptoms of the disease. It ran a 50 day course with complete clinical recovery.

**DIAGNOSIS.**—In a case observed by H. Mallié (Jour. de Méd. de Bordeaux, Aug. 25, 1927) the typhoid syndrome was of average intensity. Blood taken from the patient, however, gave a pure culture of *B. coli*. In a 2d case, results of serum examination on the 12th day were negative for Eberth's and for paratyphoid organisms. In the 3d case, the patient had had paratyphoid B. infection the year before. In both these cases

the urine, taken aseptically, contained colon bacilli.

**TESTS.**—The *antithrombin test*, introduced by Kitzmiller and Mills, has recently been subjected to 3 changes in technique which are described by Mills (Arch. Inter. Med., May, 1927). He now uses purified fibrinogen and thrombin solutions. The 2d change is the use of 0.1 or 0.2 c.c. of the patient's serum. The 3d improvement consists in the taking of only a single reading of the thrombin activity of the mixtures at the end of 2 hours, instead of the repeated readings previously advised.

The *hemoclastic test* for the differential diagnosis of typhoid, paratyphoid and undulant fevers, according to L. D'Amato (Riforma Medica, Jan. 9, 1928), is based on the injection of the respective vaccines. The result is considered positive when the decrease of leukocytes after the injection of the vaccine is about or over 1000. In 48 cases of undulant fever, the test with melitensis vaccine was invariably positive, while it was negative, or at the most doubtful, with typhoid vaccine. On the other hand, the test was positive with typhoid vaccine in 39 cases of typhoid, while negative, or at best doubtful, with melitensis vaccine. In 16 cases of paratyphoid, the melitensis test proved consistently negative, while the typhoid vaccine yielded positive or doubtful results. Control tests with milk injections in 18 cases of undulant fever and 12 of typhoid and paratyphoid proved negative.

A comparative study of the *agglutination test* and the *Otani test* was conducted by Hilario and Ira (Rev. Filipina de Med. y. Farm., Nov., 1925). They concluded that the

Otani test was the more reliable. They found that while a negative agglutination test does not positively exclude typhoid, a negative Otani excludes entirely the possibility of typhoid or paratyphoid. The test is based on the intensification of the opsonic power by the microbic antigens, as revealed by the phagocytic index. The technic is simple: 4 or 5 drops of blood are drawn into a test tube containing 1 drop of the sodium citrate solution. When well mixed, a small quantity is taken up in a capillary pipet and to this is added an equal amount of a fine emulsion of the bacilli of the disease in question. After mixing as usual the pipet is sealed in the flame and is placed in the autoclave at 37° C. or in the water bath at 38° C. In 10 minutes the tube is withdrawn and a drop of the contents is placed on a slide for microscopic examination of the blood; it is stained, and the phagocytes are counted. The test is reliable even in the first 2 or 3 days of typhoid or paratyphoid, and in infants as well as in adults.

In a case of typhoid observed by Ross (Med. Jour. of Austral., May 22, 1926), there was no immunologic response evident as to repeated agglutination tests, though clearly a case of typhoid and proved to be so at necropsy. Culture tubes were inoculated with blood, stools and urine taken during life, but no typhoid bacilli were grown; no reaction was obtained to the Widal test throughout the illness.

**ETIOLOGY.**—According to P. Krause (Zentralbl. f. inn. Med., Apr. 2, 1927), the danger from *carriers* cannot be overestimated, although care on the part of the carrier himself may restrict dissemination of the infection. He considers **cholecystectomy**

and **appendectomy** as warranted operations. Bersch (Med. Klinik, Mar. 12, 1926) removed the gall-bladder containing calculi in 5 typhoid bacilli carriers. No elimination by the patient of typhoid bacilli has been observed since. Haaland and Haaland (Norsk Mag. f. Laegevid., Nov.-Dec., 1927) report 42 cases of chronic carriers of typhoid and paratyphoid found in western Norway from 1918 to 1927 (38 in women). Of these, 14 were treated surgically, 12 with success. Food and milk appear to be the chief infective mediums.

An examination of 156 persons who had recovered from typhoid fever within from 6 months to 2 years were found by Leach, Dehler and Havens (Amer. Jour. Pub. Health, Apr., 1926) to include 10.3 per cent. typhoid carriers. These results show a percentage distinctly higher than reported by previous investigators in the United States.

The influence of *sewer gas* has been revamped by various authors. To this and *soil gases*, Wolter (Münch. med. Woch., July 8, 1927) traced the recent epidemics of typhoid in Germany, in accord with Pettenkofer's views.

N. Sette (Policlinico, Dec. 12, 1927), as an example of the putrid gases in reactivating latent typhoid fever, cites a patient who worked in sewers, in whom 4 successive attacks developed in the course of 5 months. All blood cultures and serum tests proved negative the first 3 times. The 4th time a blood culture was positive for typhoid. Of interest in this connection is the fact that rats and mice may be disseminators of typhoid B bacilli. Organisms of the typhoid B group were found by Friesleben

(Deut. med. Woch., Sept. 16, 1927) in the feces of large numbers of healthy slaughter-house animals, but agglutination tests indicated that the types present were not pathogenic to man. Paratyphoid B organisms isolated from the feces of 52 per cent. of 50 wild mice and 19 per cent. of 100 wild rats, on the contrary, were indistinguishable culturally or serologically from the types pathogenic to man. It is possible that the infection of man may in these conditions not be attributable to foul air but to *parasites* derived from the rodents.

**PROPHYLAXIS.**—According to Bruni (Hygiene Moderna, Sept., 1927), the Italian Army now uses a typhoid **lipovaccine**, the excipient of which is a vegetable oil. This has done away with abscesses and other complications observed after the older vaccine. But very slight reactions occurred in about 30,000 soldiers vaccinated. In 100 of the group, the size of the spleen was determined after vaccination; in about  $\frac{1}{2}$  a moderate swelling was detected. Most of those vaccinated develop agglutinins of a rather high titer (1:320) after 8 days.

Hilgermann (Münch. med. Woch., Dec. 23, 1927) urges the use of very small doses, 1:100,000 to 1:1,000,000, on the plea that massive doses may lower rather than raise the resistance of the organism. By using very small doses the dangers of protective inoculation during an epidemic are avoided. That a general or a visible local reaction ought to follow every inoculation he deems erroneous.

E. Bertarelli (Archivos de Biol., June, 1927) states that at San Paulo, Brazil, during a severe typhoid outbreak in 1925, the value of oral in-

oculation against the disease was tested, the oral method being used in 23,000. There were 72 cases of typhoid among those vaccinated. In 51 of these patients the subcutaneous method had been chosen, in 15 the oral route, in 1, both, and in 5 information on this point could not be obtained.

Experiments were made by Burke and Barnes (Jour. Infect. Dis., July, 1926) to determine whether typhoid proteins were absorbed unaltered from the digestive tract as determined by the appearance of agglutinins. On the whole, the results obtained were not satisfactory.

R. Lovaglio (Riforma Medica, June 21, 1926) observed an irregular and atypical form of the fever in soldiers who had been vaccinated against typhoid about a year ago. The course of the disease was shorter and high fever was rare, but enlargement of the spleen was constant, while diroctism and intestinal hemorrhage were frequently observed.

**TREATMENT.**—Very little of material interest has appeared in this connection. Hänsch and Hartmann (Deut. med. Woch., Nov. 25, 1927) recommend **blood transfusion** in the treatment of typhoid. They used the blood of typhoid convalescents or of persons immunized against typhoid or even of non-immunes, if necessary. There appeared to be no difference in the results obtained. From 250 to 400 c.c. of citrated blood was injected intravenously, but not when pulmonary complications were present. Pulmonary complications seemed to be prevented. No untoward effects were noted. Of 34 patients treated by blood transfusion, only 2 died; of 150 patients not transfused, 14 died.



Tyau (Nat'l. Med. Jour. of China, Apr., 1926) regards **mercurochrome**, given early and judiciously, as the most effective remedy in both typhoid and paratyphoid fevers. The drug should be freshly prepared and given intravenously at 3-day intervals in 10-c.c. (2½ drams) doses for mild infections; while in severe cases it should be given in the dosage of 5 mgm. (¼ grain) per kilo. (2½ pounds) of body weight. In either mild or uncomplicated cases, no deaths were observed, while the course of the disease was shortened.

Saunders (Mo. State Med. Assoc. Jour., Apr., 1927) also praises the intravenous use of **mercurochrome**, but combined with **guaiacol inunction**, the latter being rubbed into the skin in doses proportioned to age, and always followed by an oil rub to prevent irritation. This will also reduce the temperature.

Intestinal antiseptics is advocated by V. E. Lawrence (Clin. Med. and Surg., Feb., 1927) on the basis of extended experience. If the case is seen early, *i.e.*, before any hemorrhages have occurred, he administers a saline laxative as a preliminary, then follows it with **zinc sulphocarbolate**—chemically pure, to prevent gastric disorder—in 5-grain (0.3 Gm.) tablets hourly with a large amount of boiled water.

**TYPHUS FEVER, BRILL'S DISEASE.**—K. N. Maxcy (Public Health Reports, Dec. 24, 1926), of the

United States Public Health Service, in a comprehensive study of Brill's disease, concludes that it is clinically indistinguishable from typhus fever except with regard to its relative mildness and low fatality rate, and that it is endemic in the southeastern United States. Its epidemiology appears to differ significantly from that of Old World typhus. Its epidemiological characteristics afford no evidence suggesting louse transmission and are interpreted as being at variance with man-to-man transfer by lice, unless it be assumed at the same time that the disease occurs mostly in unrecognizable form. It is suggested as a hypothesis which seems to afford a more probable explanation of the mode of transmission that a reservoir exists other than in man, and that this reservoir is in rodents, probably rats or mice, from which the disease is occasionally transmitted to man.

**TREATMENT.**—Nicolle and Conseil (Arch. de l'Inst. Pasteur de Tunis, Dec., 1925) found that **serum** from cured asses is equivalent to a convalescent's serum, and advocate its use in place of human convalescent serum in preventive work. Kusama, Tsuchiya and Nakajo (Japan Med. World, June 15, 1927) found that an immune **serum** obtained by immunizing a horse with typhus bacillus as the antigen, had prophylactic and therapeutic efficacies against experimental typhus fever.

## U

**ULCER, VARICOSE.**—Carrell (Ills. Med. Jour., Oct., 1927) obtained excellent results from the use of **tannic acid solution** in the treatment of varicose ulcers. After the ulcerated area has been rid of infection, it and the surrounding skin are cleansed with alcohol and dried; then, with an ordinary nasal spray, a 2.5 per cent. solution of tannic acid is sprayed on every half hour until the ulcer is well crusted over. A fair crust will be formed in 10 or 12 hours. Contracture of the crust will cause frequent cracking, but the fissures are readily covered by additional spraying. No dressing is necessary after the treatment is begun.

Cannon and Lowenfish (Arch. Dermat. and Syphil., June, 1927) cause thrombosis of the veins by injecting into them from 0.5 to 2 c.c. (8 to 32 minims) of **sodium salicylate solution** and then bandaging the leg with 2-inch (5 cm.) gauze soaked in a warm solution of **Unna's gelatin glue**. The composition of this is: zinc oxide, 1000 Gm. (32 ounces); gelatin, 600 Gm. (20 ounces); glycerin, 1400 c.c. (48 ounces); and distilled water, 2200 c.c. (73 ounces). The cast may be left on for 1 or 2 weeks, being changed only when soaked with secretions from the ulcer, or when the patient complains of undue pressure. Injections are usually made into the veins about once a week, or whenever the casts are changed. They may be made into a single vein in several different locations, but usually not closer than 3 inches (7.6 cm.) apart. The number of treatments varies from 1 to 7, and the total quantity of the injected solu-

tion from 0.5 to 25 c.c. (8 minims to 6¼ drams). The formula of the injection fluid is: sodium salicylate, 1.8 Gm. (28 grains); procaine hydrochloride, 0.05 c.c. (¾ minim), and distilled water, enough to make 6 c.c. (1½ drams).

Marcovici (Arch. Dermat. and Syphil., Aug., 1928) recommends an ointment of 1 per cent. **neoarsphenamine**. A layer of this ointment was applied only once, at night, over the surface of the wound. The treatment proved painful, so that an anesthetic was added as follows: neoarsphenamine, 0.3 Gm. (5 grains); ethylaminobenzoate, 2 Gm. (30 grains); white petrolatum, 30 Gm. (1 ounce). After 1 application, a 10 per cent. **bismuth subgallate ointment** was applied for the next few days. The ulcer has not recurred in any case.

**UREMIA.**—M. Nathan (Presse méd., Jan. 22, 1927) concludes, after reviewing various researches, that the convulsions are caused by metabolic disequilibrium, resulting in an excess of creatinine and a reduction of calcium in the blood. Insufficiency of the parathyroids may be the origin of the changes in the metabolism.

In a man, aged 52, observed by K. O. Moller (Hospitalstid., Nov. 3, 1927) the symptoms of uremia appeared suddenly, without preliminary signs of renal insufficiency. The intravenous injection of **sodium sulphate** in strongly hypertonic solution was at once followed by remarkable improvement. However, he doubts the effectiveness of the sodium sulphate infusion in uremia following long-continued renal insufficiency.

**URETHRA.—URETHRITIS.**—B. C. Corbus (Trans. Amer. Med. Assoc., May, 1927) states that most cases of non-gonorrheal urethritis of bacterial origin occur as a result of infection carried from within out and not from without in. There has been a general impression that Little's glands, stricture of the urethra, prostatitis and seminal vesiculitis are the most common etiologic factors in perpetuating non-gonorrheal infections of the male urethra. In a large percentage of cases, divided urine cultures and pyelographic studies show that pyelonephritis, as a result of focal infection with poor kidney drainage, is often the cause of persistent non-gonorrheal urethritis. The consumption of spurious grades of liquor may enhance the condition.

**URINE.—ACIDITY.**—The Newbauer Method is deemed inconvenient by Strauss (Schweizer med. Woch., Jan. 7, 1928). He suggests, instead, the use of *methyl red*, which gives a red color to a highly acid urine. Markwalder (*Ibid.*) also recommends a mixture of *methyl red* and *methyl blue* (equal parts of each in a 0.5:1000 alcoholic solution) for testing the reaction of urine. In the presence of acid this solution turns blue; in the presence of alkali, green. In a dark bottle, the reagent keeps well. It is adapted to quantitative examination.

Muschat (Jour. of Urology, Apr., 1926) found that **ammonium chloride** in 1 Gm. (15 grain) doses, 3 times daily, causes a decided increase in the normal urinary acidity. It may be used in the same dosage to change the reaction in cases of alkaline cystitis.

**CASTS.**—According to Feuchtwanger and Lederer (Jahrb. f. Kinderheilk., Mar., 1926), acidosis is the dominant cause of the formation of urinary casts in infants. It also increases the amount of urinary colloids which furnish the material for the casts. The authors were able to induce albuminuria and cylindruria by administering calcium chloride. Jackson (Amer. Jour.

Pathol., May, 1927) adduces evidence to the effect that at least certain casts in chronic nephritis are formed by the coalescence of granules found in the circular reticulum of the kidney, and that this reticulum is in turn formed by an abnormal budding of the renal cells. This process is not peculiar to the kidney, for it has been seen in other organs under varied conditions. The reaction is the result of an abnormal environment to which the cells involved are subjected.

**DIASTASE.**—According to Cohen (Biochem. Jour., xx, 253, 1926), the rate of appearance of diastase—also known as amylase, an enzyme which converts starch into glucose—in the urine is greater during the daytime than at night. It is not due, however, to the taking of food. Variations occur from day to day in the total daily and nightly output of diastase in healthy persons. It is, therefore, clear that no significance can be placed on figures unless they differ markedly from the normal over a period of several hours.

Diastase is also found in malt. Klein (Deut. med. Woch., Mar. 4, 1927) modified Castellani and Taylor's mycologic method for the determination of various carbohydrates in the urine, notably maltose and pentoses. He uses a thick emulsion of the micro-organisms and tincture of litmus. Typhoid and Shiga bacilli are useful for the differentiation of maltose, typhoid and paratyphoid B for that of arabinose.

J. Fabrivius-Miller (Ugeskrift f. Laeger, Mar. 25, 1926) found unusual amounts of diastase in the urine in 23 cases of tenderness over the pancreas. In 8 of the cases, disease of the pancreas was confirmed by operation or necropsy. In 7 there was mild pancreatitis or merely compression from a gall-stone; the diastase and the tenderness disappeared after the jaundice had subsided or the gall-stone been passed in the stools, or both. The diastase content ranged from 250 to 16,000 units in this group. In 3 other cases the diastase content ranged from 200 to 1000 after subsidence of a mild pancreatitis under medical measures alone. In another case of 500 diastase units, there was a juxtapyloric ulcer; in another with 250 there was jaundice from gall-stones or cancer metastasis, and in 1 with 300, cholecystitis was beyond question.

In this last group of 8 cases, pancreas disease was not certain but it was equally difficult to affirm that the pancreas was sound.

**NITROGEN.**—To determine the total nitrogen in the urine, T. Shimoda (Sei-I-Kwai Med. Jour., Jan., 1927) converts various nitrogenous bodies in it into ammonium sulphate by boiling with the author's special digestion mixture, which is as follows: To a cooled solution of about 70 c.c. of water and 3 Gm. of potassium sulphate, dissolved by boiling for a few minutes, 10 c.c. of concentrated sulphuric acid and 4 c.c. of a 10 per cent. copper sulphate solution are added, made up to 100 c.c. with distilled water free from the least trace of ammonia, and then mixed. The ammonia solution is then treated with the Nessler-Winker's reagent, and the color produced is compared with that of a standard solution of an ammonium salt treated in the same way.

B. Rapinesi (Policlinico, July 1, 1926) found that the administration of table salt increases the elimination of nitrogen in healthy subjects as well as in certain nephritis patients. In the latter the nitrogen elimination increases sometimes several days after the administration of the salt.

**URTICARIA.**—The treatment of this cutaneous disorder brought on by sensitiveness to many foods, has invaded particularly the field of endocrinology. Legrand (Clinique, vol. xx, 1925), in reviewing the subject, states that the causal alimentary anaphylaxis is due to an insufficiency of the digestive enzymes, notably those of the pancreas. He, therefore, administered **pancreatin** and found it effective provided a pure preparation was used, and the dose sufficiently large at first: from 1.5 to 1.8 Gm. (23 to 28 grains) and given immediately after a meal.

Kesten (Arch. of Dermat. and Syphil., Aug., 1927) administered **ephedrine sulphate**, which acts much as does **adrenalin**, known to be effective in the disease. In the 6 chronic cases treated with ephedrine sulphate

orally, giving 10 to 120 mgm. ( $\frac{1}{8}$  to 2 grains) every 3 hours for from 1 to 7 weeks, complete relief was obtained in 2 and improvement in 2. In 11 others similarly treated, 7 were cured, 2 were improved and 2 were unimproved.

C. Pariser (Deut. med. Woch., June 3, 1927) used **testicular and ovarian gland** successfully, the cases being very obstinate and recurrent for many years. After the gonad therapy, the urticaria no longer recurred.

Pasteur, Valléry-Radot, Blamoutier and Laudat (Bull. de la Soc. méd. des hôp., Apr. 30, 1926), having found a low alkali reserve in 2 of 7 cases, administered intravenous injections of 3 Gm. (45 grains) of **sodium bicarbonate** in 100 c.c. ( $3\frac{1}{8}$  ounces) of water. This prevented further attacks, although the daily ingestion of 15 or 20 Gm. ( $3\frac{3}{4}$  to 5 drams) for a week, was ineffectual. Of 5 patients with normal or exaggerated alkaline reserve, the influence of sodium bicarbonate was manifest only in one.

**UTERUS.—CANCER OF THE CERVIX.**—Wertheim's radical operation is the treatment of choice at the Charité women's clinic. In a review of the results, Wille (Zentralbl. f. Gynäk., Jan. 1, 1927) states that in 308 cases treated surgically between 1916 and 1920, 45.8 per cent. gave a 5-year cure. For the last of these years, the percentage was 56.05; for patients operated on in an early stage, 76 per cent., for patients whose tumors were already in the borderline between operability and inoperability, 25 per cent. Franz extends the limits of operability farther than



do many. Infiltration of the parametrium was not a contraindication, unless bone was involved. Involvement of the vaginal wall, slight mobility of the uterus, complicating myoma or adnexal changes were not permitted to interfere, but carcinomatous involvement of the bladder was a contraindication. No woman over 65 years old was submitted to operation. Fourteen women were under 30 years of age. Werner (Surg., Gynec. and Obstet., Mar., 1928) states that the improvement of the technic of the Wertheim operation and post-operative irradiation has reduced the primary mortality from 10 to 5 or 6 per cent.

At the Bellevue Hospital, of New York, carcinoma of the cervix is not subjected to operation, according to Kaplan (Radiology, Oct., 1927). The lesion is treated by (1) **disinfection** of the local area; (2) **X-ray** therapy of the pelvis; (3) **radium** therapy to the local lesion, and (4) **radium puncture** and **endothermic surgery** when needed. The dosage varies with the histology and extent of the lesion. The treatment is given at once, with small doses over long periods. High voltage X-rays, with heavy filtration, and **radon** in heavily filtered platinum tubes are used for the specific radiation therapy.

The results of **radium** therapy in 60 cases of cancer of the uterus are given by J. L. Ransohoff (Ohio State Med. Jour., Sept., 1926). Of these, 6 were well and free from recurrence from 14 to 5 years after treatment, although 4 had been operable, 1 borderline and 1 inoperable. The author concludes that the results of radium treatment of early carcinoma of the cervix are at least as favorable as

those following operation. In contrast to the formidable operative procedures the method is safe, and free from unpleasant sequelæ. He urges that radium treatment should supplant operation in the treatment of early cases.

**RETROVERSION.**—A review of 1000 cases of retroversion operated by a group of surgeons by Hurd (Amer. Jour. Obstet. and Gynec., June, 1927) showed that 96 per cent. of anatomic cures throughout the period of observation, which averaged 20 months, had been obtained. There appears to be little choice between the several varieties of round ligament suspension as far as mechanical end-results are concerned. Of the operations frequently done, Bissell's yielded the lowest and Gilliam's the highest percentage of recurrences. End-results of retroversion operations considered symptomatically appear to depend largely on the symptoms which the lesion produces. One may expect a higher proportion of cures when the patient enters for pain, backache or other discomfort than when she applies for relief of sterility or some disorder of menstruation. That the reconstructed supporting ligaments of the uterus can undergo evolution during pregnancy is demonstrated by the paucity of spontaneous abortions in women who have undergone operation.

**PROLAPSE.**—L. Brady (Surg., Gynec. and Obstet., Oct., 1926) warmly advocates the **Watkins operation**. On the basis of clinical experience he concludes that vaginal fixation is the operation of choice after the childbearing age not only because of the diminution of shock as compared with abdominal section,

but because it yields excellent results. In 45 out of his 48 patients, complete recovery occurred. Repeatedly examined subsequently, the patients showed complete absence of prolapse, Johnson (*Ibid.*, Apr., 1926) had nearly 90 per cent. of cures from his treatment of these cases. He has modified the **Watkins operation**. The whole anterior surface of the uterus down to the cervix is sewed to the fascia of the anterior vaginal wall.

Thus the uterus is firmly fixed in anteversion to the fascia, and the bladder rests on the posterior aspect of the body of the uterus.

Lack of food is a prolific cause of uterine prolapse. Magid (*Zentralb. f. Gynäk.*, Dec. 3, 1927) states that the percentage of uterine prolapse among the refugees from the Russian famine-stricken province in 1921-1922 was more than 4 times as great as that among the native inhabitants from 1919-1926.

## V

**VALVULAR DISEASES.—MITRAL STENOSIS.**—A widening of the left pupil in patients with mitral disease, especially when the auricle is dilated, has often been observed by Mondolfo (*Riforma Medica*, July 26, 1926). The phenomenon cannot, however, be produced in a strong light. It is more pronounced in the early stage than later.

Chamberlain and Dock (*Arch. Intern. Med.*, Oct., 1927) studied the curves of the heart border motion from films taken with Ruggles' roentgen-ray cinematograph, the result showing that in mitral disease the motion of the auricular region is of great significance. A patient with a marked thrill and loud diastolic murmur, but slight systolic murmur, gave curves which are interpreted as those of mitral stenosis. Two patients with loud systolic and soft localized diastolic murmurs gave curves which apparently indicate the preponderance of regurgitation. In 1 of these, autopsy revealed a mitral orifice with a circumference of 7 cm. held open by a scarred and calcified margin.

**AORTIC VALVE.**—H. J. Crawford (*Jour. Clin. Investig.*, Aug. 20, 1927) studied the nature of capillary pulse in aortic insufficiency by means of cinematography in 12 cases in which macroscopic capillary pulsation was present. Simultaneous electrocardiograms were made so that the relation of the capillary changes to the heart beat could be studied. Variations in the diameter of the arterial and venous limbs took place continuously. The changes in the arterial limb in some subjects were more marked than those seen in normal individuals, but the changes in the venous limb as a rule were not so marked as in the arterial and resembled those seen in the normal. No evidence was present to indicate that pulsation due to the heart beat was present in the capillaries examined.

In 7 cases of aortic insufficiency reported by Davis (*Kans. Med. Soc. Jour.*, May, 1926), none was caused by syphilis. Electrocardiograms showed very little change. There was a prolonged P-R interval in the other 2. Two showed left ventricular pre-

dominance. In 1 case, there was definite myocardial change as evidenced by the inversion of the T waves in leads II and III. The writer's experience is that non-syphilitic endocarditis is the most frequent cause of aortic insufficiency in young adults.

Katsilabros (Presse méd., Oct. 15, 1927) obtained the double murmur of Durozier in aortic insufficiency by compressing the femoral artery, not with the stethoscope itself, but with the finger. By compressing the femoral artery, 1 or 2 cm. below the inguinal fold, with 1 or 2 fingers, and auscultating above with the binaural stethoscope, without making any pressure, there is heard a systolic murmur in normal cases. In cases of aortic insufficiency, there are 2 murmurs: 1 systolic, the other diastolic. With the binaural stethoscope, the 2d murmur, if it exists, is rough and long. Following this procedure, the author found the double murmur in nearly all the cases of aortic insufficiency.

**TRICUSPID.**—This valve is seldom taken into account in heart disorders and yet during a 10-year period Kerr and Morrison (Cal. and West. Med., Feb., 1927) diagnosed 95 cases of tricuspid insufficiency during life. In 12 cases out of 25 coming to post-mortem examination the tricuspid valve was found to be the seat of endocarditis, but in only 3 of the 12 cases was the condition recognized during life. In others in which tricuspid endocarditis was suspected, there was no opportunity to examine the heart post mortem.

**VARICELLA. — COMPLICATIONS.**—In a review of his own

cases, E. Glanzmann (Schweiz. med. Woch., Feb. 12, 1927) found that serous meningitis, encephalitis and myelitis were the most important complications. They appeared at least in chicken-pox and vaccinia—between the 5th and 15th day of the disease. He holds that the etiologic agents of the 3 diseases are related.

In a case observed by Eldridge and Rivers (Johns Hopkins Hosp. Bull., Dec., 1927), bullous lesions of impetigo were found to contain an organism, *Staphylococcus aureus*, similar to that obtained from a discharging ear. The impetigo was successfully treated with **gentian violet**.

In a child of 22 months observed by Pierret and Provost (Écho méd. du nord., Oct. 8, 1927), symptoms of meningitis appeared 17 days after the onset of chicken-pox. Pus obtained by lumbar puncture contained *Staphylococcus aureus*. A diagnosis of epidural abscess was made. Injections of **staphylococcus vaccine** and of a **colloidal silver** preparation were given and the child recovered. The authors know of no other case of staphylococcus epidural abscess complicating chicken-pox.

**PROPHYLAXIS.** — Greenthal (Amer. Jour. Dis. of Child., June, 1926) studied the efficacy of varicella vesicle fluid in checking the spread of varicella. Out of 36 persons vaccinated against varicella, there were 19 "takes," 16 negative reactions, while 1 patient left the hospital before the 8th day. No cases of varicella developed in those inoculated either successfully or unsuccessfully. The duration of the immunity induced by this procedure was less than 18 months in 1 instance and more than 6 weeks in another.

The use of varicella crusts to produce vaccine was not successful in the few instances in which it was tried. Inoculation of guinea-pigs with varicella virus, using the coal tar method of Teague and Goodpasture also proved unsuccessful.

**VARICOSE VEINS.**—To occlude varicose veins Sicard and Gaugier (*Presse méd.*, June 2, 1926) recommend **sodium salicylate** locally to cause sclerosis. Injections of the salicylate into the dilated vein induced a cure in 95 per cent. of their cases of small or medium varicose enlargements. The injections seemed harmless, and are not painful. A dose of 2 c.c. (32 minims) of a 20 per cent. solution is given at the 1st injection, 2 or 3 c.c. (32 or 45 minims) of a 30 or 40 per cent. solution at the 2d injection, 2 or 3 days apart. The dose of 5 or 6 c.c. (1¼ or 1½ drams) never should be surpassed. Five or 6 injections, given within from 2 to 4 weeks, caused complete sclerosis of medium sized varicose veins on 1 leg. **Mercury biniodide** or **quinine** may be indicated for large varices or in those rebellious to the salicylate. No phlebitis or embolism was ever observed with this treatment. Hypertension, heart insufficiency, kidney disease or arterial claudication, a history of phlebitis, pregnancy and uterine fibroma are contraindications.

Other observers have not been so fortunate. Among 500 cases of varicose veins treated by V. Meisen (*Acta Chir. Scand.*, July 28, 1927) by intravenous injection, there were 135 complications with ulcer cruris and 40 with chronic eczema. The solution used consisted of from 18 to 30 per

cent. of **sodium salicylate** with 10 per cent. of **sodium chloride**. The maximal dose per injection is 10 c.c. (2½ drams).

Jorgensen (*Ugeskrift f. Laeger*, Jan. 12, 1928) reported a case of salicylic intoxication in a man of 47 years, after injecting 5 c.c. (1¼ drams) of 20 per cent. sodium salicylate. The 3 previous injections had been well borne. He is unable to explain this sudden hypersensitiveness. According to G. Delater (*Presse méd.*, Oct. 15, 1927), immediately after an injection of a **salicylate solution**, one may see (about once in 200 times) an attack of vagotonia (slowing of the pulse, cold sweats, nausea without vomiting). In 1 case the signs of hemoclastic shock were discovered and an injection of **adrenalin** cut short the attack which consisted of a transitory arrest of the heart's action and of respiration every time a 40 per cent. salicylate solution was used. In another patient, who received 2 c.c. (32 minims) of 30 per cent. solution, there was a lipothymia. **Quinine** injections expose patients to phenomena of the toxic order, which are misleading and are apt to appear when the patient reaches his home. They feel depressed for 10 or 15 days, and sometimes present a miliary eruption, accompanied by itching. These symptoms may gradually disappear if treatment is continued; **oftener**, the treatments must be spaced further apart and the symptoms disappear only after the completion of the treatment. The writer has seen 5 instances of sudden manifestations after the use of doses exceeding 1 Gm. (15 grains) of quinine. Hanschell (*Brit. Med. Jour.*, Mar. 31, 1928) has treated more than 200 cases of vari-



cose veins of the leg by injecting into the varices 0.25 c.c. (4 minims) of **quinine hydrochloride**, 13 per cent.; **sodium salicylate**, 20 per cent., or **sodium chloride**, 20 per cent. The quinine salt proved the least uncertain in results.

**VARIOLA.—DIAGNOSIS AND PROGNOSIS.**—An exhaustive study of the blood in 200 cases of smallpox by Ikeda (Arch. Inter. Med., May 15, 1926) representing all forms and stages of the disease during an epidemic, presents characteristic findings which, if properly interpreted, are of definite diagnostic and prognostic value. The earlier the rise of the platelets, the sooner the approach of the desiccation period, prognosticating a shorter course of the disease. A definite leukopenia during the maculopapular stages indicates, as a rule, a mild discrete form. A progressive leukocytosis with an early high polynucleosis predicts a severe form. The higher the values, the more probable the fatal outcome. The early appearance of normoblasts, basophilic stippling and polychromatophilia, without evident anemia, are unfavorable signs. It invariably means the purpuric form of smallpox. Condensation and fragmentation of mature leukocytes are found only in the purpuric form of smallpox. They appear comparatively early in the primary type of purpuric smallpox and are usually accompanied by pathologic normoblasts, basophilic stippling and polychromatophilia, without visible anemia. A rapidly progressive, absolute lymphocytosis is a constant characteristic of purpuric smallpox.

According to Tomb (Indian Med. Gaz., Apr., 1927), smallpox may be

differentiated from chicken-pox by observing the interval elapsing between the date of onset of fever and the date of outbreak of eruption. In the case of chicken-pox, this period never exceeds 24 hours. In the case of smallpox, the interval always exceeds 48 hours.

**TREATMENT.**—In the epidemic which occurred in Minneapolis during which 1276 cases were reported in the 12 months ending February 28, 1925, and which caused 332 deaths, various therapeutic remedies were tried, but none proved of value. Two kinds of serum were used without results. Mercurochrome-220 soluble, gentian violet and neoarsphenamine were given intravenously but did not prove their worth. The patients who lived the longest of those with purpuric smallpox, 17 days, were treated with **calcium chloride**. Sweitzer and Ikeda (Arch. of Dermat. and Syphil., Jan., 1927), emphasize the fact that the best treatment is prevention. This must be accomplished by **vaccination and revaccination**, as 1 vaccination does not afford protection for a lifetime; in fact, persons who have had smallpox can get it again. The authors feel that compulsory vaccination and revaccination every 7 years would stamp out smallpox.

Ducamp, de Claret and Falgairolle (Bull. de la Soc. des sci. méd., May, 1926) observed in 4 cases that **transfusion** of convalescent's blood had a tonic and immunizing action, aiding in blood production and checking the hemorrhagic tendency. Both the eruption and the general condition showed a decided change for the better. The eruption was accelerated and attenuated, warding off pitting.

In a smallpox epidemic in Val-

paraiso, Chile, 192 patients treated by J. H. Thierry (Ugeskrift f. Laeger, Jan. 12, 1928) under **red light** from the 1st days of the disease, no noticeable effect was observed on either mortality, suppuration or scars. With but 1 exception, however, none of these patients developed eye lesions, while of those treated in day-light about 10 per cent. had corneal pustules; about 3 per cent. lost 1 eye, and 1 per cent., both eyes.

**VERRUCÆ; WARTS.**—In 33 persons C. Gram (Ugeskrift f. Laeger, Dec. 30, 1926) applied a hydrous wool fat ointment prepared by mixing 2 parts of either **calcium carbonate** or **calcium phosphate** with 3 parts of hydrous wool fat. There were no signs of cure until 2 or 3 weeks, but the warts usually disappeared in from 4 to 6 weeks.

Chavarria and Shipley (Johns Hopkins Hosp. Bull., July, 1927) took cultures from warts removed from 3 persons, members of 1 family, who became infected, 1 from another. The cultures yielded a fungus, a nocardia. The lesion would seem to have resulted from direct contact with an infected individual rather than indirectly through a vegetable or animal carrier of the microörganism. The lesions were treated successfully with an ointment consisting of **salicylic acid** 3 grains (0.2 Gm.); **mild mercurous chloride**, 4 grains (0.25 Gm.); **wool fat**, 1 ounce (30 Gm.).

**VINCENT'S ANGINA.**—J. Muños Seca (Arch. Españ. de Pediat., Dec., 1926) observed 52 cases only 4 of which were in adults. In the others the age varied from 2 to

15 years, 72.5 per cent. being from 2 to 6 years old. This argues against the alleged rôle of dental caries or vitamine deficiency. The localization was divided about equally between the 2 sides; only 2 cases were bilateral. Where conservative local treatment fails **intravenous injection of bismuth** seems to be the method of choice. Casteran and Del Piano (Rev. Med. Lat.-Amer., Jan., 1927) also found **bismuth** efficient in 14 cases treated with it, all being healed in 2 or 3 days. Their treatment comprised 1 or 2 intramuscular injections of 2 c.c. (32 minims) each, every other day and topical applications twice a day at  $\frac{1}{3}$  strength.

Reaves (Arch. Oto-laryn., Feb., 1928) advocates a 2 per cent. solution of a mixture of **acriflavine** and **gentian violet**, equal parts. One application a day will relieve the patient of pain in about 2 days, and will effect a cure in about 5 days. It acts virtually as a specific.

**VOMITING IN INFANTS.**—According to Garely (Arch. Españ. de Pediat., Mar., 1926), 25.1 per cent. of 442 infants, more or less regularly after nursing, vomit from some unknown cause. If the peristaltic functioning seems excessive, while the milk coagulates abnormally slowly, treatment should aim to promote coagulation; there is less tendency to vomit when the stomach contents are of a thick consistency. **Condensed milk** might be given a trial, and alkalis with excessive acidity. **Sodium citrate** has the advantage that it retards coagulation of the milk and allows better penetration by the digestive juices while neutralizing the irritating acid. Holding the child erect promotes ex-

pulsion of gases. As most of these children are gaining in weight, and as the vomiting often ceases spontaneously, it must be regarded as merely an exaggeration of a physiologic process.

Rousseau-Saint-Philippe (Bull. de l'acad. de méd., May 17, 1927) contends that repeated vomiting observed in infants during the 1st days or months after birth is connected with dyspepsia at least in 95 per cent. of the cases. In the remaining, it is occasioned by congenital obstruction

of the pylorus. It occurs more frequently in breast fed infants. The puerperal condition, constipation, intestinal infection, phlebitis, lymphangitis, nervous disorder, latent syphilis or tuberculosis in the mother may be responsible for the presence of an injurious substance in the maternal milk. The treatment consists in administration of **alkalis**, **pepsin** and **hydrochloric acid**. Inhalation of **oxygen** is a useful adjuvant. In cases of pyloric stenosis operation is indicated.

## W

### WOUNDS, HEALING OF.—

An experimental study in rabbits by Halley, Chesney and Dresel (Johns Hopkins Hosp. Bull., Oct., 1927), showed that when a granulating wound was inoculated with a strain of *Streptococcus erysipelatis* which was capable of bringing about an intense inflammatory reaction in a fresh wound, little or no sign of a renewed inflammatory reaction was observed in the surrounding skin area. Furthermore, cultures from such a wound, taken from 3 to 5 days after inoculation, indicated that the streptococci disappeared or diminished. Approximately similar results occurred when the granulating wounds were inoculated with *Staphylococcus aureus*, but the staphylococci did not disappear as rapidly from the granulating surface as did the streptococci.

To influence the course of infection by increasing the hydrogen ion concentration of the blood and tissue fluids Nather and Jalcowitz (Arch. f. klin. Chir., May 6, 1927) gave **ammonium chloride** with a **diet rich in**

**meat** to groups of patients. The healing of furuncles and abscesses after incision was hastened and good results were observed in a large number of post-operative suppurations, especially colon bacillus infections. In other forms of infection, osteomyelitis, empyema, sepsis, etc., the results were negative.

Ellice McDonald and A. Godfrey (Med. Jour. and Rec., May 5, 1926) suggest **calcium lactate** in large doses, **parathyroid extract** by mouth (in  $\frac{1}{10}$  grain—0.0065 Gm.—doses, 3 times a day) and, in addition, intramuscular injections of 2 units of Collip's parathyroid extract every 2d or 3d day. This measure, 1st employed in patients with *gastric ulcer* who were greatly benefited, was then used as a preliminary to operation with a view to aiding healing of the wound, and in certain cases after gastro-enterostomy where occult blood persisted in the stool, after the operation.

In a comprehensive experimental study of **diet** in the healing of wounds Herrmannsdorfer (Deut. Zeit. f. Chir.,

Mar., 1927) found that the acid-base metabolism of patients with wounds differs from that of healthy persons. Both locally, at the seat of inflammation, and in the blood and other body juices the reaction is displaced toward the alkaline side. The alkali reserve, however, and therewith the buffer capacity of the blood, is lowered in wound healing. The substances in the blood are diminished more in the case of suppurative than of aseptic wounds; the lowest values, however, are found after the infection has been overcome. It is evident that general, "compensated" acidosis and local true acidosis should be looked upon as measures of defense and not as dangerous phenomena of intoxication. An **acid diet** lowers the buffer capacity of the blood and the  $pH$  of the urine, of the wound secretion and of the saliva. An alkaline diet has the opposite effect. In an experimental study of patients on an alkaline diet, it was found that the conditions in the wound became worse, the suppurative processes extended and there were flare-ups in old foci. The secretion increased and the wound showed no tendency to diminish in size. With an acid diet the wound became smaller, the secretion diminished or ceased, the granulations took on a healthy appearance. With an alkaline diet the bacteria increased in number and variety. Besides streptococci and staphylococci, *B. proteus*, *B. pyocyaneus*, pseudodiphtheria bacilli, anaerobes, spore-bearing bacteria and *Sarcina* were abundant. In the wounds of patients on an acid diet, the number and variety of bacteria decreased greatly; bacteria disappeared from the circulating blood.

The **galvanic current** is advocated

by Diemer (Deut. Zeit. f. Chir., May, 1927) to promote healing in the presence of local disturbances of circulation. By electrolysis and the excitation of endosmotic processes, it results in a local collection of nutrient substances suitable for complete cell metabolism. The method would appear to be of especial value in transplantations. Six cases are described in which it was used. The current should not exceed 1.5 milliampères per square cm. at the anode and 0.4 milliampères per square cm. at the cathode, and from 10 to 15 minutes should be the maximum length of each application.

**HEALING DRESSINGS.**—Weill (Presse méd., June 9, 1926) found **horse serum** efficacious as a dressing for wounds of the face, hands or fingers. As it dries, it forms a protecting varnish. Gauze or cotton, soaked in the serum, is applied to the wound. When nearly dry, 5 minutes (or less if a current of hot air is applied), the wound may be dusted with **boric acid**. The serum film does not retract, like collodion, and it clings closer, while it can be easily rinsed off.

Roulet (C. r. de la soc. de biol., Dec. 3, 1926) practiced incisions in the backs of guinea-pigs and then injected 1 c.c. (16 minims) of a 3 per cent. solution of **Witte's peptone**, close to the wound. Cicatrization was more rapid than was observed during treatment with embryonal juice. This confirms Carrel's statement that peptones have an effect on the phenomena of cellular nutrition.

The antitoxic action of **balsam of Peru** was demonstrated by Brunner and Silberschmidt (Zeit. f. Chir., Jan. 29, 1927) in guinea-pigs when introduced into artificially contaminated



wounds, the infective agent being earth containing malignant edema and tetanus germs. The dose of balsam of Peru was from 1 to  $1\frac{1}{2}$  c.c. (16 to 24 minims); the quantity of earth, 0.05 Gm. ( $\frac{5}{6}$  grain). When the interval was longer than 6 hours, the balsam was without effect. The 6-hour interval corresponds to Friedreich's inoculation time. The authors also introduced into a cutaneous muscle wound in guinea-pigs a lethal dose of tetanus or botulinus toxin, followed immediately by the balsam.

All the animals died, although death was postponed as long as 5 days. A further series of guinea-pigs were treated with subcutaneous injections of balsam and toxin mixed *in vitro*. All the animals thus treated remained alive. Some of the doses and the intervals between mixture and injection were as follows for guinea-pigs weighing 360 and 320 Gm.: balsam of Peru, 0.2 c.c.; tetanus toxin,  $\frac{1}{120}$  c.c., interval 5 minutes; balsam of Peru, 0.5 c.c.; toxin,  $\frac{1}{50}$  c.c., interval two days.

## X

**X-RAYS.—GENERAL EFFECTS.**—According to Burrows, Jorstad and Ernest (Radiology, Mar., 1928), the X-rays apparently cause molecular disintegration in cells. Small doses accelerate activity in the body and in the cells in that they accelerate the normal molecular disintegration, which liberates the energy for life more than other detrimental forms of disintegration. Larger doses destroy the more fundamental structural elements of the cell. The resistance of an animal or a patient may be raised appreciably by the use of a well proportioned dietary, rich in vitamine A.

**ACID BASE EQUILIBRIUM.**—The X-rays, according to G. von Pannewitz (Arch. f. klin. Chir., Dec. 29, 1926), bring about a 2-phase reaction, the first acid, the 2d, alkaline. After irradiation of the stomach, the alkaline phase is most prominent. After irradiation of the liver, the acid phase is augmented and the alkaline does not take place. Since X-ray sickness occurs always during the alkaline phase, it is absent or slight after irradiation of the liver. The acid phase is the direct result of the irradiation, while the alkaline is brought about by stimulation of the vagus by decomposition products. Accordingly, a causal treatment or prophylaxis of X-ray sickness would be based on tranquilizing the vagus or stimulating the sympathetic. Good results have been achieved with **lobelin**.

**BLOOD.**—As regards blood proteins, Wichels and Behrens (Zeit. f. d. ges. exper. Med., June 18, 1927) observed that normal individuals react to an X-ray irradiation by an increase in serum albumin. Allergic individuals (including patients with asthma) react with globulinemia. When the irradiation was repeated during the height of the blood change, the reaction was reversed.

In respect to coagulation, glycemia and calcemia, Zunz and La Barre (C. r. de soc. de biol., Jan. 21, 1927) examined the blood of rabbits before and after exposure of the splenic region to X-rays. It appeared that penetrating rays, which accelerate coagulation, also increase the content of calcium and of glucose in the blood. This is accompanied by rise in blood-pressure. Further researches indicated that doses of X-ray enhancing coagulation cause an abnormally large secretion of adrenalin into the blood.

**ENDOCRIN ORGANS.**—H. L. Wintz (Radiology, ix, 285, 1927) states that X-ray irradiation of these organs has proved of value not only as a therapeutic procedure in certain endocrin disorders but also in experimental investigations. As the various cell groups of the glands differ in their radiosensitiveness, it is possible, by the aid of the X-rays, to inhibit certain parts of the glands while others continue to function. Such a selective action was previously unattainable. The actions which are theoret-

ically possible when exactly graduated quantities of the rays are applied to an endocrin gland are: (1) total destruction of the gland; (2) temporary impairment of all of the glandular tissue with maintenance of the possibility of regeneration; (3) complete destruction of highly sensitive cell groups with complete preservation of less sensitive cell groups, and (4) a general increase in the activity of the cells, *i.e.*, stimulation. These possibilities require very exact dosage.

**GENITO-URINARY TRACT.**—On the basis of clinical experience Young and Waters (Amer. Jour. Surg., Feb., 1927) state that the best treatment for superficial **papillary carcinoma**, whether localized or extensive, is a combination of deep X-ray therapy with radium applied directly to the surface of the growth. Radium alone has been very successful in this type of case, but frequently so much irradiation is required that the destruction of the tumor is followed by a severe radium ulceration. In

the author's experience, the results obtained by the combination of deep X-ray irradiation with radium are better when the tumor has received from 600 to 800 mgm. hours of radium before the X-ray treatment is started.

**SKIN DISEASES.**—G. M. MacKee (Trans. Amer. Med. Assoc., May, 1927) states that over 80 skin diseases are more or less amenable to X-ray therapy. The X-ray is the most important single remedy in dermatology, but it must not be abused, and it should not prevent knowledge and use of dermatologic materia medica and therapeutics. It is now advisable for each operator to standardize his machine and his technique by simple biologic experiments. Voltage is so much more accurately estimated by means of the voltmeter than the spark gap that the latter is being discarded. The author deems it doubtful whether a true idiosyncrasy exists, but there probably are marked variations in susceptibility to the X-rays in different individuals.

## Y

**YAWS (FRAMBESIA).**—The campaign by the Philippine Health Service for the mastery of this disease has emphasized anew, according to C. Santiago (Mthly Bull. Philippine Health Service, Dec., 1925), that **salvarsan** is the most effective drug for eradicating yaws and that because of the immediate results derived from the treatment, it is now certain that yaws in the Philippines may be soon eradicated through an intensive and extensive campaign.

**YELLOW FEVER.**—W. H. Hoffmann (Jour. Trop. Med. and Hyg., Jan. 2, 1928), in view of the simplicity of the histologic diagnosis, and be-

cause it is superior to any other method, urges that it should be made obligatory in every fatal case the cause of which is unknown, whenever there is a possibility of yellow fever, and especially in the endemic territory of West Africa, as it is actually the only objective and reliable diagnostic basis for a systematic campaign.

H. Hanson (Amer. Rev. of Tuber., July, 1926) observed 4 atypical cases of yellow fever in Salvador, 3 of which were modified by **vaccine**, and the 4th arrested in its incipency by the administration of the **yellow fever serum**.

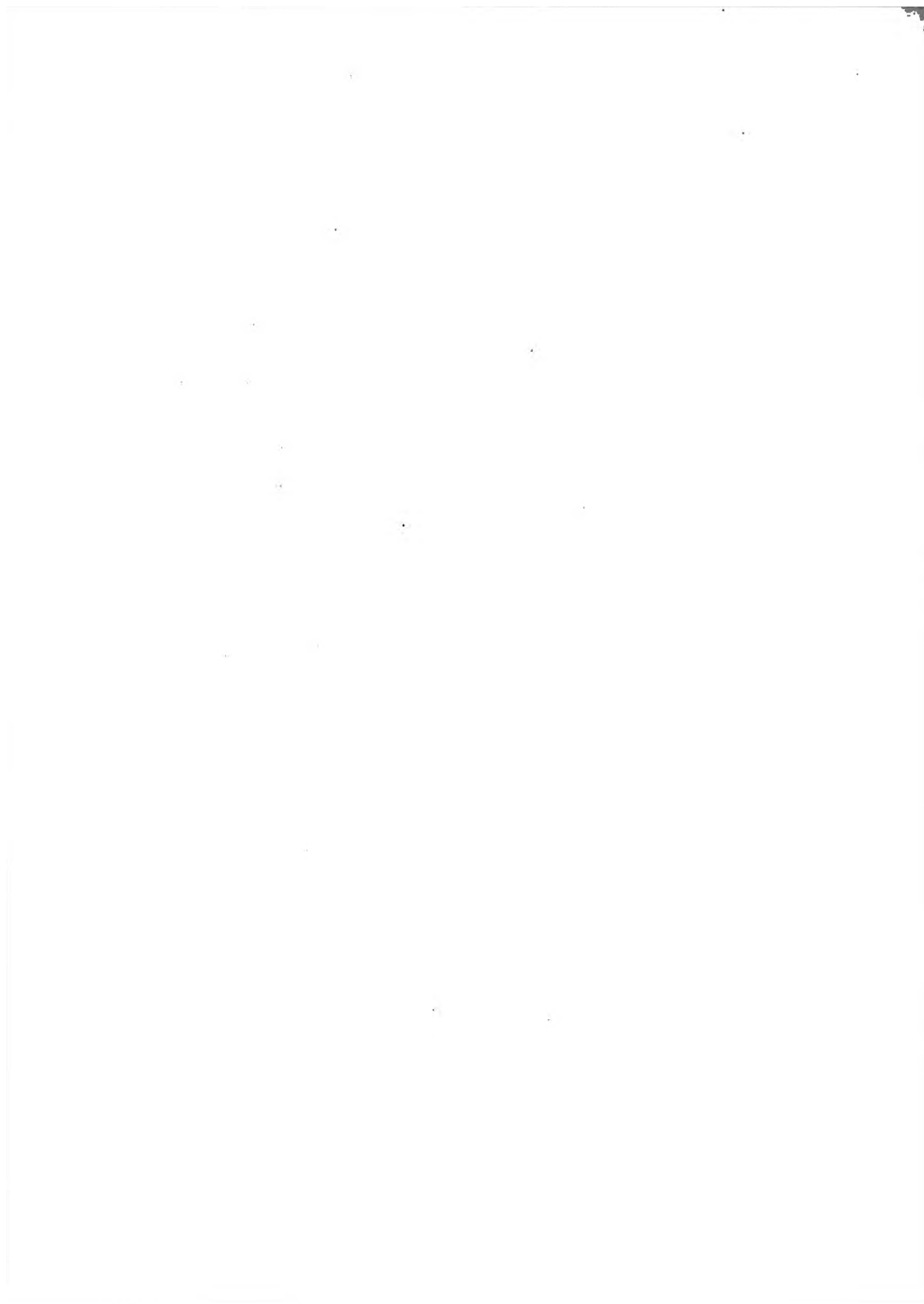
## Z

**ZINC.**—In the Mayo Clinic, 30 gynecological cases in which zinc chloride had been used were selected from 1492 cases in which surgery was advised for some pathologic condition of the uterus. In 416 cases, dilatation and curettage were done, in 471 cases, hysterectomies were done, in 75 cases myomectomies were done, and in 500 cases radium was used. Experience with the method leads Masson and Foucar (*Amer. Jour. Obstet. and Gynec.*, Sept., 1925) to believe that it has a very limited field; it is probably not applicable in more than 2 per cent. of uterine cases. However, in cases in which the treatment is especially indicated, satisfactory results are usually obtained. The chief disadvantage is the lack of any very accurate means of dosage. The advantages of the procedure are its simplicity and the fact that the endometrium can be destroyed without injury to the ovaries. A major operation can be avoided in certain borderline cases. Should this treatment prove unsatisfactory, hysterectomy can still be performed.

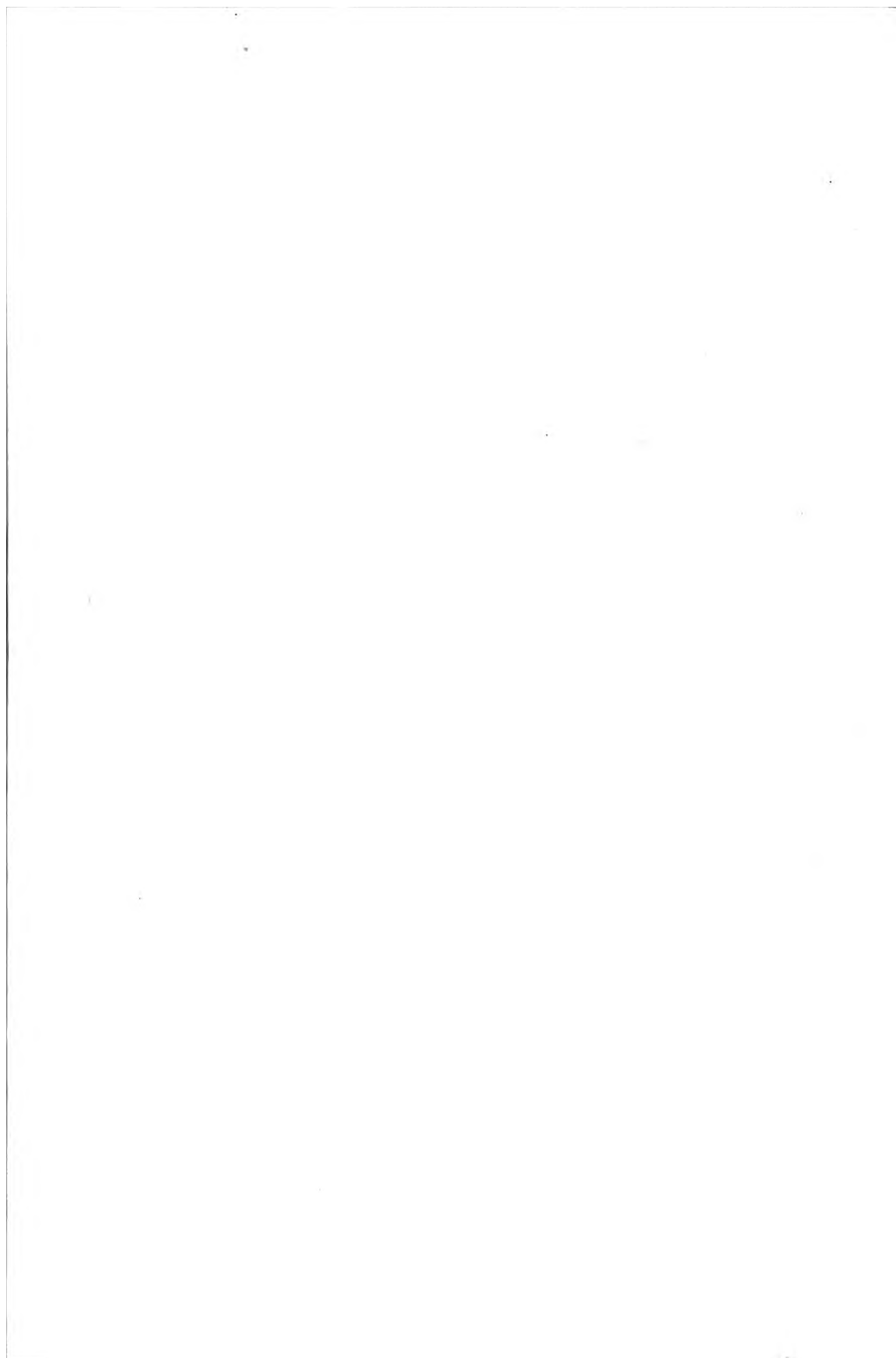
The general harmlessness of zinc is emphasized by the researches of Heller and Burke (*Jour. Biol. Chem.*, July, 1927) who found that zinc added to a normal ration in the form of pure zinc dust, of zinc oxide or of certain zinc salts, in amounts as great as ever found in contaminated foods, did

not interfere with growth, reproduction and normal functions of the rat through 3 generations. No pathologic conditions were found in the organs of rats fed the rations used in this experiment.

**UNTOWARD EFFECTS.**—Inhaled by infants, zinc may prove fatal, probably through mechanical asphyxia, as instanced by the death of 1 who had inhaled zinc stearate. The child, according to Schlaepfer (*Amer. Jour. Dis. of Child.*, Apr., 1926), was 7½ months old, and died 34 hours after inhaling the zinc dusting powder. Cyanosis and dyspnea soon occurred, and acidosis was noted 12 hours before death. At the necropsy the lungs were voluminous. Extensive areas of emphysema were separated from each other by small, scattered, atelectatic zones. The bronchioles contained plugs of zinc stearate and mucus, which appeared as worm-like masses. The gross picture was confirmed histologically, and the presence of extensive edema was determined. The edema involved the alveoli, especially the more atelectatic ones, and the subpleural and interlobular connective tissue septums. The lymphatics throughout the lung were conspicuously dilated. In spite of oxygen inhalation, persistence of the dyspnea may have been due to acidosis brought about by incomplete obstruction to the bronchioles with zinc stearate.





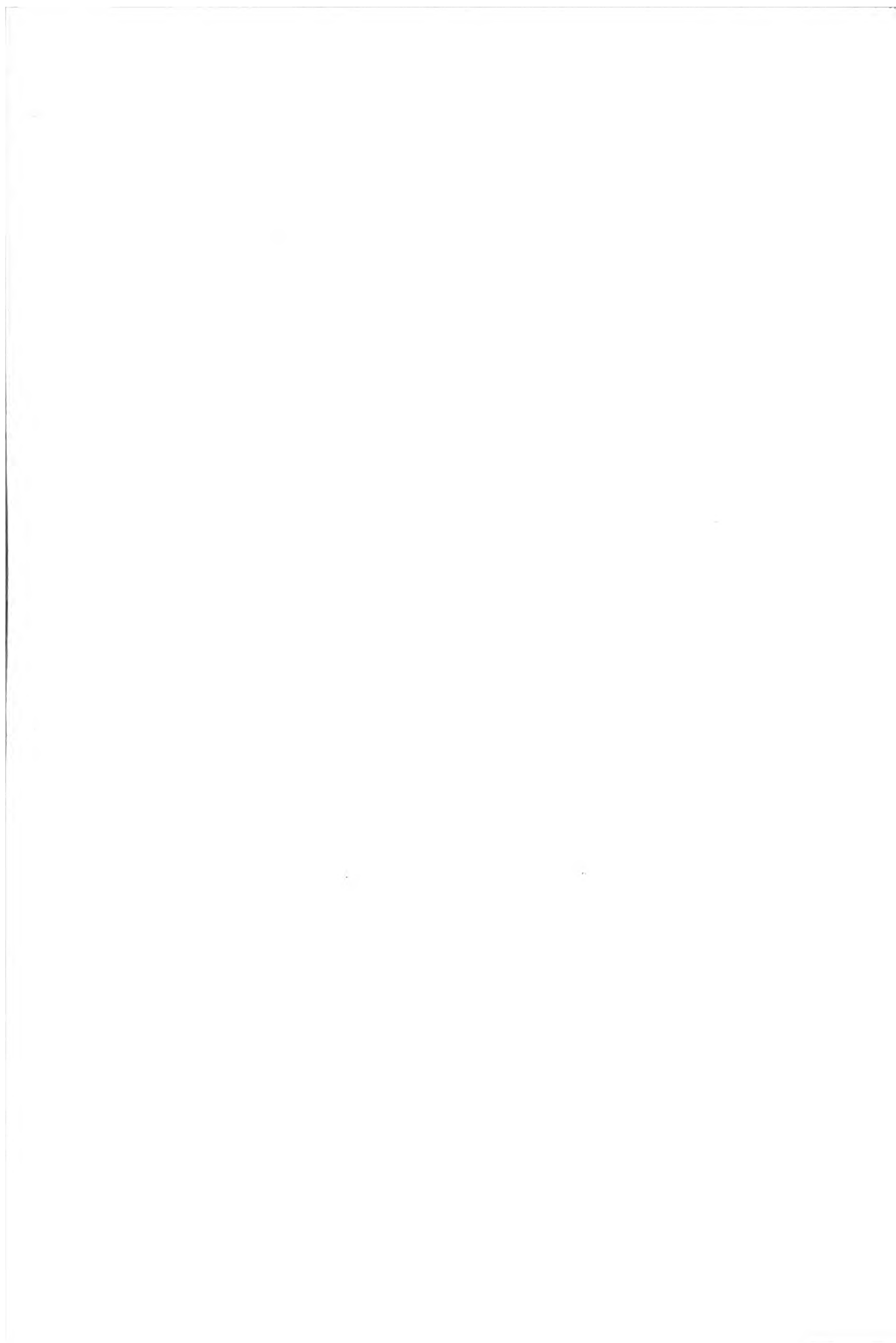














UNIVERSITY OF ILLINOIS-URBANA



3 0112 112265449